REDACTED

PRELIMINARY ASSESSMENT REPORT

Potential Hazardous Waste Site

SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

Prepared for:
U.S. Environmental Protection Agency

Prepared by:
Tennessee Department of Environment and Conservation
Division of Superfund-Knoxville Field Office
2700 Middlebrook Pike, Suite 210
Knoxville, TN 37921
423-594-5479

Authored by: ______________________ Date: Jan 7, 1998

Checked by: ______________________ Date: 1/8/98

Reviewed by: ______________________ Date: __________

10958751

U.S. EPA REGION IV

SDMS

POOR LEGIBILITY

PORTIONS OF THIS DOCUMENT MAY BE DIFFICULT TO VIEW DUE TO THE QUALITY OF THE ORIGINAL.

TO MAKE THE DOCUMENT READABLE, TRY ONE OR MORE OF THE FOLLOWING:

From the Displays Settings in Windows Control Panel:

1. Set the Color Quality to the highest available: 24 bit or 36 bit.
2. Increase or decrease the Screen resolution.

From the Monitor/Display Controls:

1. For dark image page, increase the brightness and decrease the contrast.
2. For light image page, decrease the brightness and increase the contrast.

** PLEASE CONTACT THE APPROPRIATE RECORDS CENTER TO VIEW THE MATERIAL**

V. 2-040506

TABLE OF CONTENTS
SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

(continued)

FIGURES

*

EXECUTIVE SUMMARY

SMOKEY MOUNTAIN SMELTERS
U.S. EPA # TND098071061
TSDF #47-559

This Preliminary Assessment Report presents the findings of a study conducted at Smokey Mountain Smelters (SMS), 1508 Maryville Pike, Knoxville, Knox County, Tennessee. The site is located in Knox County, just outside the Knoxville City Limits. The former manufacturing operations are inactive, and the Site is abandoned and unused.

Concern for the potential release of hazardous substances at the site is due to the nature of the former manufacturing operations (secondary aluminum smelting, production of ingots), and past environmental violations.

The probable point of entry to surface water is believed to be the surface drainage to the nearby unnamed tributary of Flenniken Branch. The Stream is classified for Fish and Aquatic Life, Recreation, Irrigation, and Livestock Watering and Wildlife. At approximately 1.6 miles along the surface water pathway is the Flenniken Branch embayment of the Tennessee River (Fort Loudoun Lake) where the remainder of the surface water pathway is additionally classified for Domestic Water Supply, Industrial Water Supply, and Navigation.

Additional investigatory efforts are required to determine the total quantity of hazardous substances and the threats posed by air emissions from the wastes, by potentially contaminated groundwater, by potentially contaminated water and sediment in the surface water pathway, and by potentially contaminated soil at the Site.

The site is recommended for further investigation through the CERCLA process.

PRELIMINARY ASSESSMENT REPORT
SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

1.0 INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Tennessee Division of Superfund (TDSF), under contract with the United States Environmental Protection Agency (EPA), conducted a Preliminary Assessment at the Smokey Mountain Smelters, 1508 Maryville Pike, Knoxville, Tennessee, 37920. This site was assigned the identification number of TND098071061 by the U.S. EPA Office of Air and Radiation, and 47-559 by the State of Tennessee Department of Environment and Conservation. The purpose of this Preliminary Assessment was to assess the immediate or potential threat wastes at the Site pose to human health and the environment and to collect information to support a decision regarding the need for further action under CERCLA/SARA. The information gathered was utilized to support a preliminary evaluation of the site under the Hazard Ranking System (HRS). The preliminary assessment included a review of previous site assessment data, and gathering information and supporting documentation to characterize the human population and adjacent environment that could be impacted by any contamination present at the site.

2.0 SITE DESCRIPTION

2.1 Location

The Smokey Mountain Smelters Site is an inactive secondary aluminum smelter (KCDAPC 1080) located just outside of the city limits of Knoxville, Knox County, Tennessee, on Maryville Pike, State Secondary Route 33 (Vicinity Map, Figure 1). The geographic coordinates of this facility are 35 degrees, 55 minutes, and 9 seconds North Latitude, and 83 degrees, 55 minutes, and 36 seconds West Longitude (Site Plan, Figure 2). The immediate area surrounding the facility is medium commercial and dense residential development. The property location, 1508 Maryville Pike, is that listed for the largest parcel, upon which the process building lies (see Ownership Cards, Appendix 1).

2.2 Facility Description

The Smokey Mountain Smelters Site, as observed during October 1997, consists of one large industrial process building (constructed in 1928) and several smaller outlying buildings, located on five parcels of real estate. The property (Property Map, Figure 3) totals approximately 13 acres (see Ownership Cards, Appendix 1). The largest building is approximately 100 feet wide, 300 feet long, and 50 feet high. It houses two natural gas fired rotary furnaces, one casting furnace, a large overhead crane, and provides dry storage for process raw materials. Large air ducts lead to two small outside baghouses near the southwest corner of the building. A portion of the north wall of the building has collapsed. Features outlying the main building include a small transformer area to the north, a burned office building or house across a paved driveway with truck scales farther to the north, a concrete building foundation to the northeast, two curious jumbled concrete slabs farther to the northeast, Site railroad tracks and a related building to the east, a 25 feet by 100 feet lagoon holding water to the southeast, a maintenance building to the south, and large continuous gray-colored waste piles covering most of the remaining property to the south. These features are shown in Figure IV and in the photographs.

Evidence indicates that the facility was also engaged in primary (White 1995) production of aluminum.

2.3 Operational History

In September 1979, (b) (6) . And (b) (6) (b) (6) purchased several tracts of property from (b) (6) (b) (6) . The deed for this transaction (Book 1691, Page 646) indicates part of the property was owned by American Agricultural Company. An on-site or nearby (Maupin 1997e) industrial well is named for Knoxville Fertilizer Company (TDC/DG 1956). It is believed the property operated prior to 1979 as an agricultural or fertilizer business.

Smokey Mountain Smelters, a.k.a. Rotary Furnace, Inc., of 1455 [SIC] Maryville Pike, was established in 1979 (White 1995). The 1455 street number was submitted by (b) (6) to the Knox County Department of Air Pollution Control (KCDAPC) on a permit application (KCDAPC 1980), and the facility's address was always referred to as 1455 Maryville Pike thereafter by KCDAPC.

No primary aluminum production cells, or "pots", and related heavy electrical equipment were observed during inspections at the facility during October 1997. Large blocks of materials, stored inside the building, resemble spent anode or cathode materials from primary aluminum production. Such materials might contain recoverable aluminum.

Raw materials included aluminum dross; the product was aluminum ingots (White 1995). Unapproved materials were sometimes charged to the rotary furnaces (KCDAPC 1989). Wastes included baghouse dust and slag from the rotary furnaces. One estimate of the waste generation rate was 90-120 cubic yards per week (TDHE/DSWM 1990) approved as a special waste for disposal at a permitted solid waste disposal facility. It is unknown if any of this waste was ever taken to such a facility. Much of the waste was dumped on-site, and some of this may have been buried (KCDAPC 1983). The dump had an ammonia odor, was not fenced in on all sides, and often was burning (KCDAPC 1983). The Knox County Department of Air Pollution Control received numerous complaints about the facility, performed many inspections, and cited many violations (KCDAPC 85, KCDAPC 1989).

Operations ceased sometime after May 1994 (Burress 1994).

2.4 Sensitive Environments

The sensitive environments within a four miles radius, and along the 15 miles of surface water pathway, of Smokey Mountain Smelters include all of the wetlands (Table 7) along the 15 miles of surface water pathway. The first wetland along the 15 miles of surface water pathway from the Site occurs approximately 1.6 miles from the Site at the Fort Loudoun Lake impoundment on Flenniken Branch. It is a Lacustrine, Littoral, unconsolidated bottom, semipermanently flooded, diked/impounded wetland having 4000 feet of frontage in a minimal stream (<10cfs).

Records indicate the occurrence of several threatened and/or endangered species within the Knoxville, Bearden, and Shooks Gap quadrangles (TDEC/DNH 1997).

2.5 Climatology (TDC/DG 1956)

East Tennessee does not lie directly within any of the principle storm tracks that cross the country. The area is influenced primarily by storms that pass along the Gulf Coast and thence up the Atlantic Coast, and to a lesser extent by those that pass northeastward from Oklahoma to Maine.

TEMPERATURE

The difference in elevation between mountain top and valley in East Tennessee causes a considerable variation in temperature. The mean annual temperature of East Tennessee, based upon records from Chattanooga, Knoxville, and Bristol is between 57 and 58 F. Temperature extremes of -32 F in Johnson City and 111 F in Blount County have been recorded. July is the hottest month and January is the coldest. The usual date of the last killing frost ranges from March 30 in Hamilton County to May 10 in Johnson and Carter Counties. The usual date of the first killing frost ranges from October 5 in Johnson and Carter Counties to October 30 in Hamilton County. The growing season varies from 150 to 210 days, depending upon latitude and elevation.

PRECIPITATION

Precipitation in East Tennessee is controlled in part by topography. It is heavier on the Cumberland Plateau and in the Unaka Mountains than in the Valley and Ridge province. Moist air masses reach the Valley and Ridge province comparatively dry because, in passing over the mountain on either side, their moisture is condensed and precipitated.

Rainfall is well distributed in the study area throughout the year. Knoxville's wettest months are January, February, and March (averaging 4.66, 4.51, and 5.05 inches, respectively) and the driest are September, October, and November (averaging 2.68, 2.62, and 3.07 inches, respectively). Snow occurs only occasionally and lightly in the lowland or valley land, and usually melts within a few hours or days except in shaded areas or near the tops of some of the highest ridges.

The topography largely controls the prevailing wind direction. The prevailing winds are from the northeast (15% of the time) and the southwest (12% of the time), but they are relatively light (mean speed is approximately 7.5 mph). Calm conditions exist 11% of the time (USDC/NOAA 1968).

2.6 Soils

Site soil types identified by the Soil Conservation Service on Figure 6 include Armuchee and Litz soil materials (G_E), Leadvale and Whitesburg silt loams undulating phases (L_D), Lindside silt loam (L_G), and Sequoia silty clay loam eroded rolling phase (S_K). A general description of the soil types is provided in the Knox County Soil Survey (USDA/SCS 1955).

3.0 SOURCE IDENTIFICATION

3.1 Potential Source Materials

The facility may have operated as an agricultural or fertilizer facility several years ago since records indicate part of the property was owned by American Agricultural Company (Appendix 1, Book 1691, Page 646) and an on-site or nearby (Maupin 1997e) industrial well is named for Knoxville Fertilizer Company (TDC/DG 1956). Underground storage tanks are not known to exist.

A suspected mixture of dross and anode/cathode wastes from primary aluminum production, and baghouse dust and slag from secondary aluminum smelting and casting, was observed at the Site in October 1997. An ammonia odor coming from the waste mixture was noticed and the presence of ammonia in the atmosphere was measured (Table 2).

The atmospheric reactions of trace ammonia gases are known to include formation of ammonium sulfate and oxidation to nitrate (Wark/Warner 1981).

Lithium and fluoride compounds, and, thus, lithium and fluoride, may be present due to the use of lithium carbonate, aluminum fluoride, and cryolite (Na_3AlF_6) in aluminum production.

3.2 Waste Sample Locations

Waste samples were collected by the State of Tennessee, Division of Superfund in October 1997. Approximately four waste samples were collected from on-site waste piles. The sample locations are shown in Figure IV and in the photographs. Sample #WA-01 was collected from an outside waste pile containing a blue granular substance. Sample #WA-02 was a composite sample of baghouse dust collected from several of the collection hoppers underneath the baghouses. Sample #WA-03 was a composite sample of the loose material at the waste blocks inside the main building. Sample #WA-04 was collected from the subsurface of an outside waste pile.

Air sample locations are shown in Figure IV and in the photographs. Sample #PDT-01 was collected at ground level at a disturbed waste pile. Sample #PDT-02 was collected near Sample #PDT-01, but at 3 feet elevation above the waste pile. Sample #PDT-03 was collected at the water level in the lagoon. Sample #PDT-04 was collected at a pile of waste blocks inside the main building. Sample #PDT-05 was collected inside the boring formed by collection of Sample #WA-04 eight days previously. Sample #PDT-06 was collected near Sample #PDT-05, but at the waste pile surface. Sample #PDT-07 was collected at the Sample #WA-02 location.

3.3 Waste Sample Analytical Results

The analytical results of waste samples indicated the presence of several hazardous substances. The analytical results are summarized in Table 1, "Detected Hazardous Substances". The air monitoring results indicated the presence of ammonia at two locations. The air monitoring results are presented in Table 2, "Air Monitoring Results".

3.4 Site Regulatory Status

Information regarding the facility's regulatory status has been found in the EPA's Facility Index System (FINDS). The facility was listed with EPA's Office of Air and Radiation with the Identification Number TND098071061.

The Knox County Department of Air Pollution Control (KCDAPC) performed several inspections and cited several violations from 1983 through 1989 (KCDAPC 1985, KCDAPC 1989).

TABLE 1 - DETECTED HAZARDOUS SUBSTANCES

SEDIMENT AND WASTE SAMPLES / SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TN - 10-21-97

HAZARDOUS SUBSTANCE CATEGORY	PARAMETER		SD-01 SEDIMENT	WA-01 BLUE SUBSTANCE ON OUTSIDE WASTE PILE	WA-02 BAGHOUSE DUST	WA-03 WASTE PILE IN MAIN BLDG	WA-04 OUTSIDE WASTE PILE
INORGANICS	ALUMINUM		7130	96700	65500	88800	135000
	AMMONIA		121	331	1026	132	135
	ANTIMONY		3	13	9	5	9
	ARSENIC		6	6	6	7	11
	BARIUM		63	52	30	111	222
	BERYLLIUM		1	U	U	2	1
	CADMIUM		0.8	U	15.6	U	1.4
	CALCIUM		8000	5630	11400	5850	9680
	CHROMIUM		44	79	6	52	93
	COBALT		10	3	4	6	13
	COPPER		809	42900	754	1080	576
	CYANIDE		1.08	U	U	U	U
	IRON		12500	9920	4860	14800	15400
	LEAD		47	291	129	53	96
	MAGNESIUM		2860	5410	24600	9060	8240
	MANGANESE		511	384	144	388	339
	MERCURY		U	U	0.73	U	U
	NICKEL		233	240	551	169	326
	PERCENT SOLIDS		75.8	67.0	75.2	90.4	78.6
	POTASSIUM		869	695	4230	15000	5250
	SELENIUM		U	8	2	1	2
	SILVER		U	2	1	U	U
	SODIUM		7200	17100	107000	47400	9880
	VANADIUM		32	38	U	49	76
	ZINC		523	2330	4020	1350	1140
VOLATILE ORGANICS	TOLUENE		J 0.6	J 1.4	3.6	2.3	4.7
	BENZENE		U	U	J 0.8	U	U
EXTRACTABLE ORGANICS	BIS(2-ETHYLHEXYL)PHTHALATE		288	J 477	541	572	U
	DIETHYL PHTHALATE		U	B,J 157	U	U	B,J 125
	BENZO(a)ANTHRACENE		136	U	239	U	U
	BENZO(a)PYRENE		155	U	609	U	U
	BENZO(b)FLUORANTHENE		188	U	1440	U	U
	BENZO(ghi)PERYLENE		U	U	2100	U	U
	BENZO(k)FLUORANTHENE		U	U	279	U	U
	FLUORANTHENE		252	U	396	U	U
	INDENO(1,2,3-cd)PYRENE		U	U	2170	U	U
	PHENANTHRENE		137	U	143	J 79.9	U
	PYRENE		239	U	288	U	U
	CHRYSENE		107	U	408	U	U
	DIELDRIN		3.26	U	U	U	U
RADIOLOGICAL	GROSS ALPHA		1.42	0.79	0.36	0.65	0.78 / 1.08
	GROSS BETA		12.4	2.72	7.4	21.7	11.3 / 11.5
	GAMMA RADIONUCLIDES	K-40	8.05		4.46	11.93	5.52
		Pb-214		0.219			
		Bi-214		0.242			

INORGANICS UNITS: mg/kg VOLATILE ORGANIC UNITS: ug/kg EXTRACTABLE ORGANICS UNITS: ug/kg RADIOLOGICAL UNITS: pCi/g DRY WT.
U- Analyte requested but not detected J- Estimated value--result is less than sample quantitation limit but greater than zero B- Analyte in blank as well as sample
OTHER PARAMETERS NOT DETECTED OR NOT ANALYZED, SEE [TDH/DLS 1997]

TABLE 2

PASSIVE DOSIMETER TUBE

AIR MONITORING

RESULTS

AMMONIA (NH_3)

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TN - 10-29-97

STATION	STATION LOCATION DESCRIPTION	RESULT
PDT-01	SURFACE OF DISTURBED WASTE PILE	15 PPM
PDT-02	3 FEET ELEVATION ABOVE WASTE PILE	0 PPM
PDT-03	SURFACE OF LAGOON	0 PPM
PDT-04	SURFACE OF WASTE PILE INSIDE MAIN BUILDING	0 PPM
PDT-05	INSIDE AUGER HOLE AT WA-04	20 PPM
PDT-06	SURFACE OF WASTE PILE NEAR WA-04	0 PPM
PDT-07	SURFACE OF WASTE PILE AT WA-01	0 PPM

The facility was entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), with August 6, 1997, as the discovery date (Maupin 1997f).

4.0 GROUNDWATER PATHWAY

4.1 Geology and Hydrogeology

The Smokey Mountain Smelters Site is located in the Valley and Ridge physiographic province and the nonglaciated central region hydrogeologic setting. The land surface in the Valley and Ridge physiographic region is characterized by numerous ridges and intervening valleys, all trending in the northeast-southwest direction. This orientation is the result of folding and fracturing (TDC/DG 1956). Elevations in the area of the facility range between 813 (slightly lower during Fort Loudoun Reservoir drawdown) and 1160 (Rodgers Ridge) feet above mean sea level (Figure 2, Site Plan). A detailed geologic map is presented as Figure 5.

The rocks underlying the area of the Site are of the Middle Ordovician Chickamauga Group (Holston formation). This formation is from the Lower Ordovician Series, and is characterized by extensive Karst development (TDC/Division of Geology 1956).

Groundwater within formations of this group is restricted to fractures (TDC/Division of Geology 1956). The numerous fractures that have been created through the folding and faulting experienced by these formations are largely interconnected. The groundwater yield ranges from small to moderate quantities of water to wells and springs.

4.2 Groundwater Targets

It is estimated that the amount of groundwater used in the Knoxville area exceeds 10 million gallons per day (TDC/DG 1956).

The 1990 Census revealed that in the Knoxville Metropolitan Statistical Area there were 2.56 persons per occupied housing unit (USBC 1990).

The 1990 Census revealed that in Knox County, individual wells were the source of water for 6026 housing units (USBC 1990). This amounts to 15,400 persons, in the entire county, or, proportionally, approximately 1500 in the 4 miles radius, or 50.3 square miles, study area.

Proportioned by area, by distance category, the following target populations have been estimated:

0 to ¼ mile	6
¼ to ½ mile	17
½ to 1 mile	71
1 to 2 miles	281
2 to 3 miles	468
3 to 4 miles	657
0 to 4 miles	1500

4.3 Groundwater Pathway Conclusions

A release to groundwater is suspected. On-site disposal of solid waste (baghouse dust, slag, dross, etc.) in an uncontained manner on permeable soil in a Karst region of shallow ground water has occurred. An unlined on-site lagoon receives surface water drainage from some of the disposal area. Heavy precipitation occurs in the area. The subsurface is permeable. There are several drinking water wells in the area, the nearest having a depth to water of 35 feet. Suspected nitrate, fluoride, and metals contaminants are mobile in groundwater.

There is at least moderate usage of groundwater resources in the area of the Site. The soil at the Site is porous, and the aquifer is shallow. Further investigation is warranted.

The atmospheric reactions of trace ammonia gases are known to include formation of ammonium sulfate and oxidation to nitrate (Wark/Warner 1981).

Lithium and fluoride compounds, and, thus, lithium and fluoride, may be present due to the use of lithium carbonate, aluminum fluoride, and cryolite (Na_3AlF_6) in aluminum production (Sax 1979).

5.0 SURFACE WATER PATHWAY

5.1 Hydrology

The Smokey Mountain Smelters Site is adjacent to an unnamed tributary of Flenniken Branch (Figure 4). The only surface water flow on the Site is due to stormwater runoff. The Site is not in the 500-year floodplain.

The general direction of stormwater runoff flow is to the southwest. The unnamed tributary, Flenniken Branch, and Knob Creek are classified for Fish and Aquatic Life, Recreation, Irrigation, and Livestock Watering and Wildlife by the State of Tennessee (TDEC/DWPC 1995). The remaining eleven and nine-tenths miles of the fifteen mile surface water pathway is the Tennessee River (Fort Loudoun Lake) from River Mile 637.5 to 625.6. It is classified for Domestic Water Supply, Industrial Water Supply, Fish and Aquatic Life, Recreation, Irrigation, Livestock Watering and Wildlife, and Navigation by the State of Tennessee (TDEC/DWPC 1995).

5.2 Surface Water Targets

There are many surface water targets along the 15-mile surface water pathway. These targets include users of 13.4 miles of the Tennessee River (Fort Loudoun Lake) fishery and recreation areas, numerous wetland areas (Figure 7 - Wetlands Maps), livestock, and wildlife.

5.2.1 Public Drinking Water Intakes

There are no public drinking water intakes along the 15-mile surface water pathway associated with the Site.

5.2.2 Fisheries

The 13.4 mile portion of the Tennessee River (Fort Loudoun Lake) in the 15-mile surface water pathway associated with the Site is a fishery. This portion of the River is classified for Fish and Aquatic Life (TDEC/DWPC 1995).

5.2.3 Sensitive Environments

The sensitive environments in or adjacent to the 15-mile surface water pathway include several wetlands (Figure 7 -

Wetlands Maps). The closest wetland appears to be approximately 1.6 mile downstream of the Site, in the Flenniken Branch embayment of Fort Loudoun Lake.

Endangered species and critical or sensitive habitat are as reported in the "Project review information for endangered species and critical or sensitive habitat" (TDEC/Division of Natural Heritage 1997). Records indicate threatened and/or endangered species within an approximate four miles radius.

5.3 Sediment Sample Locations

One sediment sample was collected by the State of Tennessee, Division of Superfund in October 1997. The sample was collected from a well defined drainway near the southwest property boundary. The sample location is shown in Figure IV, "Site Sketch", and in a photograph. Sample #SD-01 was a composite sample collected approximately 20 yards downgradient from the outer edge of the waste piles. The drainage area included a number of metal drums (shown in the photographs) located at the edge of the waste piles.

5.4 Waste Sample Analytical Results

The analytical results of the sediment sample indicated the presence of several hazardous substances. The analytical results are summarized in Table 1, "Detected Hazardous Substances".

5.5 Surface Water Pathway Conclusions

A release to surface water is suspected. Surface water flows in an unnamed tributary of Flenniken Branch which is adjacent to the Site. An estimated 1000 cubic yards of uncontained waste is located in an area where precipitation is sometimes heavy. Hazardous substances found in the wastes and in the sediment include contaminants harmful to fisheries and sensitive environments. Some of the detected hazardous substances are bioaccumulative.

Further investigation is warranted.

6.0 SOIL EXPOSURE PATHWAY

6.1 Site Conditions

The Smokey Mountain Smelters Site lies in a dense commercial and residential area adjacent to the Knoxville City Limit. The Site can be accessed by people because the Site property boundaries are not completely fenced to prevent access to the facility. There are many entrances to the main building. It is believed that unauthorized entries into the building and onto the disposal area have occurred.

An estimated 1000 cubic yards of uncontained wastes are on-site. Particulate migration could occur, especially since a large portion of the wastes is baghouse dust. Historical emissions could have caused migration of particulates to off-site locations.

6.2 Soil Exposure Targets

An estimated 64,408 people live within four miles of the Site, based on the 1990 census data (U. S. EPA 1990). There is no resident population. Access to the site is unrestricted, thus, soil exposure could occur if unauthorized persons enter the facility. Potential targets along the on-site soil pathway appear to be adults and children from area neighborhoods, and vagrants.

The nearest presently operating daycare facility (BELLSOUTH 1997, Figure 2), school (Maupin 1997d(Table 2), Figure 2), and residence (Figure 2, Figure 3) are over 200 feet away from suspected areas of contamination at the Site. The Montgomery Village Ministry (BELLSOUTH 1997) plans to open a daycare facility closer to the Site in January 1998.

6.3 Soil Exposure Pathway Conclusions

There is no known resident population. The nearest school and daycare facility are more than 200 feet away from the areas of known contamination. The nearest residences are in Montgomery Village, a group of multiple housing units, slightly more than 200 feet to the east. The nearest residences to the northeast are more than 200 feet away from areas of known contamination, however, one residence appears to be on or very near to Parcel #6, which may have been previously owned by the Site owner.

Hazardous substances were found in the main building and scattered throughout the southern half of the property. Particulate migration via the air pathway could occur, especially from the active facility, which would increase the possibility of exposure via the soil pathway. No samples were collected from off-site where hazardous constituents could have migrated via the air pathway. The air migration pathway is primarily to the northeast and southwest, the directions of the prevailing winds. Access to the site is not controlled. Hazardous substances are present, so exposure can occur when unauthorized entry to the site occurs. The presence of hazardous substances contaminating the soil at this site has been confirmed, but definition of the threats posed by the soil exposure pathway is not complete.

7.0 AIR PATHWAY

7.1 Site Conditions

The Smokey Mountain Smelters Site lies in a dense commercial and residential area adjacent to the Knoxville City Limit. It is believed that unauthorized entries into the building and onto the disposal area have occurred.

An estimated 1000 cubic yards of uncontained wastes are on-site. By observation and air monitoring, the waste has been found to be emitting ammonia to the atmosphere. Particulate migration could occur, especially since a large portion of the wastes is baghouse dust. The prevailing winds are to the southwest and northeast (USDC/NOAA 1968), where there are primary targets.

7.2 Air Pathway Targets

An estimated 64,408 people live within four miles of the Site, based on the 1990 census data (U. S. EPA 1990). 207 persons (primary targets) reside within ¼ mile. There is no known resident population. Access to the site is unrestricted, thus, exposure via air could occur if unauthorized persons enter the facility. Potential targets along the on-site air pathway appear to be adults and children from area neighborhoods, and vagrants.

The nearest presently operating daycare facility (BELLSOUTH 1997, Figure 2), school (Maupin 1997d(Table 2), Figure 2), and residence (Figure 2, Figure 3) are over 200 feet away from suspected areas of contamination at the Site. The Montgomery Village Ministry (BELLSOUTH 1997) plans to open a daycare facility closer to the Site in January 1998.

7.3 Air Monitoring

Air sample locations are shown in Figure IV and in the photographs. Passive dosimeter tubes were placed at seven on-site locations, and readings were taken after four hours. The sample locations are shown in Figure IV and in the photographs. Sample #PDT-01 was collected at ground level at a disturbed waste pile. Sample #PDT-02 was collected near Sample #PDT-01, but at 3 feet elevation above the waste pile. Sample #PDT-03 was collected at the water level in the lagoon. Sample #PDT-04 was collected at a pile of waste blocks inside the main building. Sample #PDT-05 was collected inside the boring formed by collection of Sample #WA-04 eight days previously. Sample #PDT-06 was collected near Sample #PDT-05, but at the waste pile surface. Sample #PDT-07 was collected at the Sample #WA-02 location. The air monitoring results are presented in Table 2, "Air Monitoring Results".

The odor of ammonia was detected by more than one TDSF employee during Site inspections. The odor threshold for ammonia in air is 46.8 ppm (Wark/Warner 1981).

7.4 Air Pathway Conclusions

The Smokey Mountain Smelters Site appears to pose a threat to human health and/or the environment via the air pathway. Air monitoring was performed at the site and ammonia was detected. The large quantity of wastes, uncontrolled access to the Site, the possibility of particulate emissions, and the presence of primary targets make further investigation of exposure via the air pathway of primary importance.

8.0 SUMMARY AND CONCLUSIONS

Mainly because of the potentially large quantity of uncontained hazardous substances, further investigation is warranted.

The highest potential for human exposure may exist through the air pathway, due to a lack of containment at the Site which is in a densely populated area. The site is probably entered by unauthorized persons; and is located within ¼ mile of approximately 207 people and several residences, and approximately one mile from an elementary school and at least one daycare center.

Potential for human exposure may exist through the groundwater pathway. Primary targets are estimated to number 6 persons, and a total of 1500 persons within the four miles radius are estimated to use groundwater.

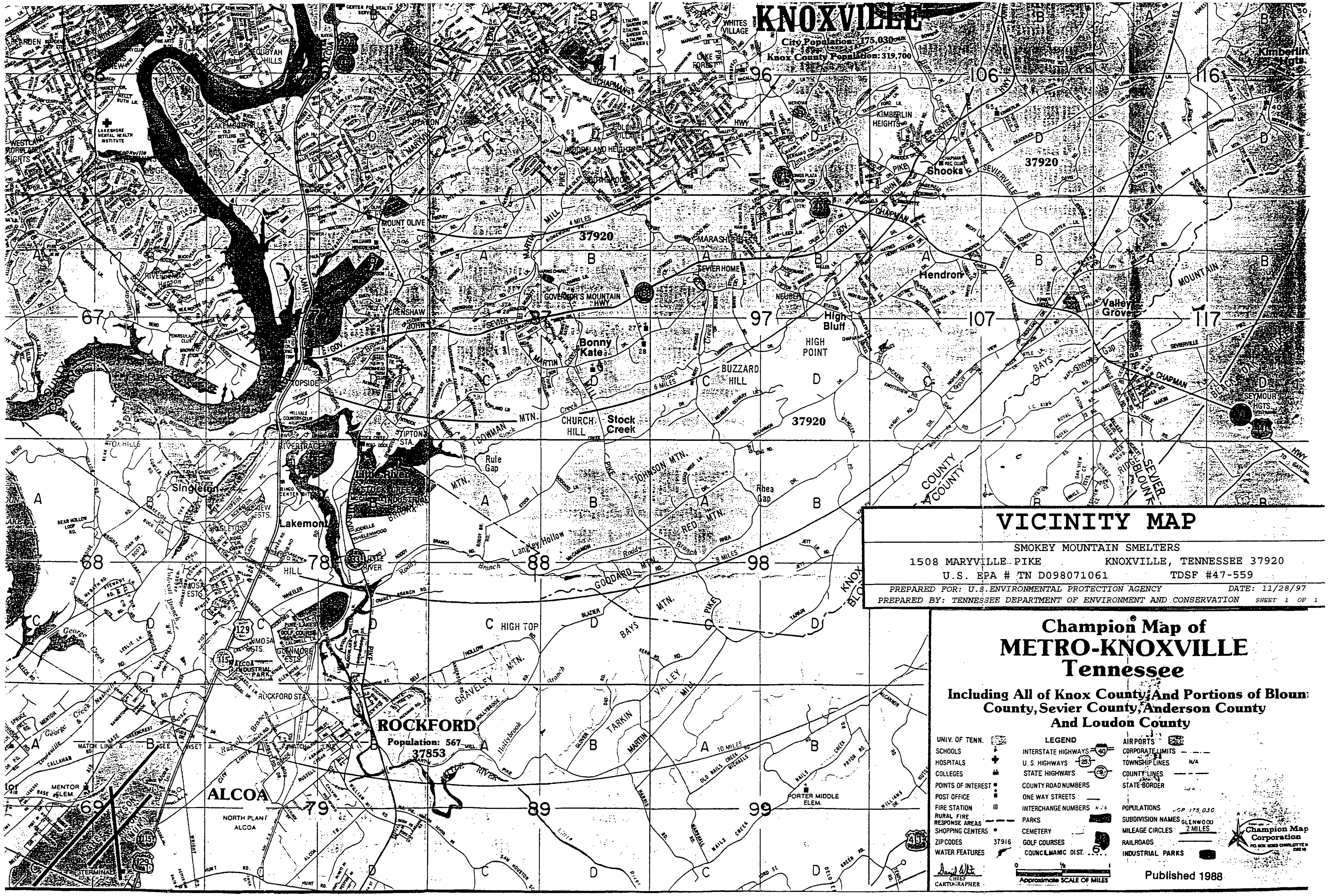
Water and sediment quality, as well as a fishery, downstream of the Site is a concern. The wastes have been found to contain several bioaccumulative hazardous substances.

The Smokey Mountain Smelters Site appears to have the potential to be placed on the National Priorities List. Therefore, the property is recommended for an immediate Site Investigation through the CERCLA process.

*****

VICINITY MAP

FIGURE 1



KNOXVILLE
City Population: 175,030
Knox County Population: 319,700
VICINITY MAP
SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TN D098071061
TDSF #47-559
PREPARED FOR: U.S. ENVIRONMENTAL PROTECTION AGENCY
DATE: 11/28/97
PREPARED BY: TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
SHEET 1 OF 1
Champion Map of
METRO-KNOXVILLE
Tennessee
Including All of Knox County, And Portions of Blount County, Sevier County, Anderson County And Loudon County
LEGEND
UNIV. OF TENN.
SCHOOLS
HOSPITALS
COLLEGES
POINTS OF INTEREST
POST OFFICE
FIRE STATION
RURAL FIRE RESPONSE AREAS
SHOPPING CENTERS
ZIP CODES 37916
WATER FEATURES
INTERSTATE HIGHWAYS
U.S. HIGHWAYS
STATE HIGHWAYS
COUNTY ROAD NUMBERS
ONE WAY STREETS
INTERCHANGE NUMBERS
PARKS
CEMETERY
GOLF COURSES
COUNCILMANIC DIST.
AIRPORTS
CORPORATE LIMITS
TOWNSHIP LINES N/A
COUNTY LINES
STATE BORDER
POPULATIONS POP 175,030
SUBDIVISION NAMES GLENWOOD
MILEAGE CIRCLES 2 MILES
RAILROADS
INDUSTRIAL PARKS
CHIEF CARTOGRAPHER
Approximate SCALE OF MILES
Champion Map Corporation
Published 1988
ROCKFORD
Population: 567
37853
ALCOA
37920
Shooks
Hendron
Valley Grove
High Bluff
HIGH POINT
BUZZARD HILL
Bonny Kate
CHURCH HILL
Stock Creek
Rule Gap
Rhea Gap
Singleton
Lakemont
CRENSHAW
MOUNT OLIVE
MARASH
SEVIER HOME
NEUBERT
KIMBERLIN HEIGHTS
HIGH TOP
TOPSIDE
TIPTON STA.
WHITES VILLAGE
LAKE FOREST
NORTH PLANT ALCOA
PORTER MIDDLE ELEM.

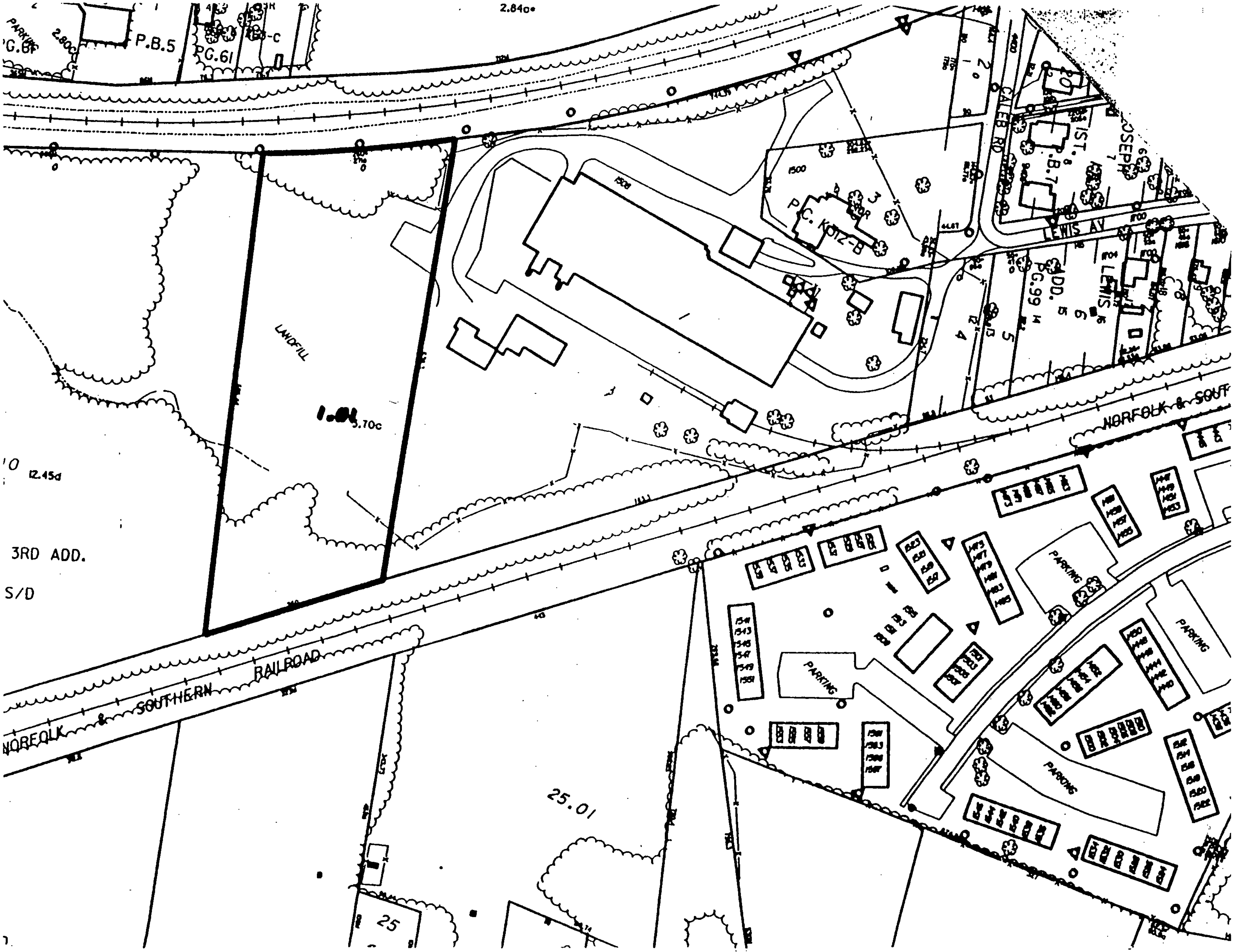
SITE PLAN

FIGURE 2

PROPERTY MAP

FIGURE 3


MARYVILLE PK
LANDFILL
SALVAGE YARD
JOSEPH LEWIS 3RD ADD.
TO VESTAL S/D
NORFOLK & SOUTHERN RAILROAD
MARYKNOX ADD
PARKING
PG.148
P.B.16
P.B.21
P.B.15
P.B.5
PG.48
25.01
23
10
15
19
20
22
9


P.B.5
PG.61
PARKING
LANDFILL
3RD ADD.
S/D
NORFOLK & SOUTHERN RAILROAD
NORFOLK & SOUTHERN
LEWIS AV
CALEB RD
25.01
25
PARKING

SMOKEY MOUNTAIN SMELTERS SITE

featuring One-half Mile Radius Circle, Buildings, 20 feet Contour Intervals, Roads, and Streams

scale: 1" ≈ 700 feet

Knox County Geographic Information Systems - January 1998

SITE SKETCH

showing

SAMPLE AND PHOTOGRAPH LOCATIONS

FIGURE 4

MDc
Chattanooga shale
(Black shale)

MDs
Basal Mississippian and Devonian shale
(Black shale above and below, silty shale and sandstone between)

Sr Sc
Sr, Rockwood formation
(Shale and siltstone, with beds of iron ore; some sandstone to southeast)
Sc, Clinch sandstone
(White thick-bedded sandstone)

DSh
Hancock limestone
(Sandy limestone and dolomite)

Ssu
Silurian sandstone and shale, undivided
(Sandstone, siltstone, and shale, with beds of iron ore in upper part)

SILURIAN DEVONIAN CARBON

Upper Ordovician

Os
Sequatchie formation
(Maroon and blue shaly limestone and limy shale)

Or
Reedsville shale
(Bluish calcareous shale)

Oj
Juniata formation
(Maroon siltstone and shale)

Ocu
Upper part of Chickamauga limestone
(Blue crystalline well-bedded limestone; upper part shaly limestone)

Och4
Chickamauga limestone, unit 4
(Blue crystalline well-bedded limestone)

Omb
Martinsburg shale
(Bluish calcareous shale)

Middle Ordovician

Olmc
Lower and middle parts of Chickamauga limestone, undivided
(Blue limestone of several kinds and yellow silty limestone)

Och3
Chickamauga limestone, unit 3
(Blue flaggy limestone and yellow silty limestone)

Om
Moccasin formation
(Maroon limy shale, shaly limestone, and blue flaggy limestone)

Ob
Bays formation
(Maroon siltstone and shale)

Och2
Chickamauga limestone, unit 2
(Blue limestone, mostly nodular and shaly; some shale to southeast)

Oo
Ottosee shale
(Bluish calcareous shale with crystalline limestone lenses)

Osv
Sevier shale
(Bluish calcareous shale with sandstone beds; blue limestone at base)

Och1
Chickamauga limestone, unit 1
(Blue cherty, massive, and silty limestone)

Oh
Holston formation
(Red crystalline limestone ("marble"), quartzose crystalline limestone, and limy sandstone)

Ol
Lenoir limestone
(Blue nodular and massive limestone)

Oa
Athens shale
(Bluish calcareous shale and shaly limestone; some sandstone to southeast; blue limestone at base)

ORDOVICIAN

Lower Ordovician

Knox group

Oma
Mascot dolomite
(Siliceous dolomite)

Ok
Kingsport formation
(Siliceous dolomite; thick limestone bed near base)

On
Newala formation
(Siliceous dolomite; some limestone beds)

Olv
Longview dolomite
(Very siliceous dolomite; limestone beds near top)

Ocl
Chepultepec and Longview dolomite, undivided
(Very siliceous dolomite; sandstone beds near base)

Ocn
Chepultepec, Longview, and Newala formations, undivided
(Siliceous dolomite; sandstone beds near base)

Ojb
Jonesboro limestone
(Blue limestone; some dolomite beds; sandstone beds near base)

Oc
Chepultepec dolomite
(Siliceous dolomite; sandstone beds near base)

OCk
Knox dolomite or group, undivided
(Siliceous dolomite to northwest, limestone to southeast)

Chilhowee group

Nebo sandstone
(White sandstone)

Nichols shale
(Greenish silty shale)

Hampton formation
(Greenish silty shale and siltstone, with feldspathic sandstone layers)

Cch
Cochran conglomerate
(Feldspathic sandstone and conglomerate)

Cu
Unicoi formation
(Feldspathic sandstone and conglomerate; some siltstone and shale)

Ocoee series

ocss
Sandsuck shale
(Argillaceous shale and silty shale, with conglomerate and sandstone lenses)

ocf
Fine grained part of Ocoee series
(Shale and siltstone, with conglomerate and sandstone lenses)

ocn
Nantahala slate
(Dark slate)

ocp
Pigeon siltstone
(Massive greenish siltstone and fine-grained sandstone)

ocgs
Great Smoky conglomerate
(Graywacke and graywacke conglomerate, in graded beds)

ocsb
Snowbird formation
(Shale, siltstone, arkose, and conglomerate)

(D shal

ocl
Lowest part of Ocoee series
(Graywacke and slate, in graded beds)

Mount Rogers volcanic group
(Purple and green metavolcanic rocks)

pCc
Pre-Cambrian crystalline complex
(Granitic and gneissic rocks with inclusions of mica and hornblende schist)

Contact

Fault

Fault
Dashed where approximately located

—?— —?—
Doubtful or probable fault

o^{13-4}
Well showing location
The first number indicates the number within the county, the second the well number in group

177
Spring showing location

Base compiled and materials assembled by C. H. Heins, G. D. DeBuchananne and R. M. Richardson of the U. S. Geological Survey

Maps prepared for printing by N. B. Johnson, C. E. James, J. B. Canter, and others of the U. S. Geological Survey

Geology compiled by John Rodgers, U. S. Geo
(For Description of sources see text)

Locations of wells and springs listed in the te
R. M. Richardson, and others of the U. S. (

GEOLOGIC MAP OF EAST TENNESSEE: ASHEVILLE, AND MASTER EXPLANATION SHOWING LOCATION OF WELLS AND SPRINGS

Scale $\frac{1}{125,000}$

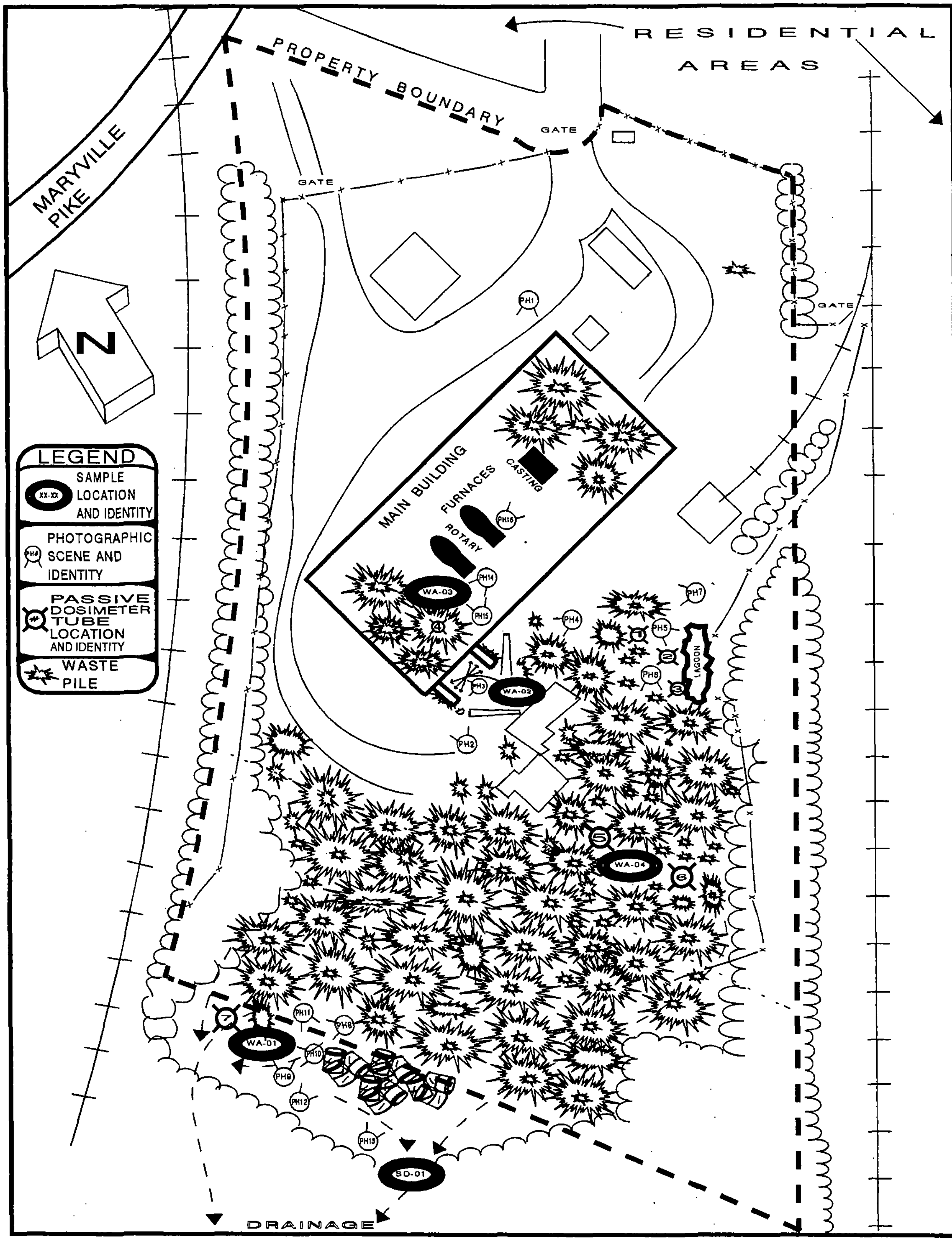
1 0 5 10 Miles

GEOLOGIC MAP

FIGURE 5

Figure IV

Site Sketch / Sample, Photo Locations
SMOKEY MOUNTAIN SMELTERS
Knox County, TN TDSF # 47-559



NOT TO SCALE. BASED ON OBSERVATIONS MADE IN OCTOBER 1987.

STATE OF TENNESSEE
DEPARTMENT OF CONSERVATION
DIVISION OF GEOLOGY

PREPARED IN COOPERATION WITH
UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY

BULLETIN 58
PLATE 9, KNOXVILLE

EXPLANAT

Symbol	Unit
ig	Paleozoic intrusive rocks
Mp	Pennington formation
Mn	Newman limestone
Mg	Grainger Formation
MDc	Chattanooga shale
Ob	Bays formation
Och2	Chickamauga limestone, unit 2
Oo	Ottosee shale
Och1	Chickamauga limestone, unit 1
Oh	Holston formation
Ol	Lenoir limestone
Oa	Athens shale
Osv	Sevier shale
OЄk	Knox dolomite or group, undivided
Oma	Mascot dolomite
Ok	Kingsport formation
On	Newala formation
Olv	Longview dolomite

Ma

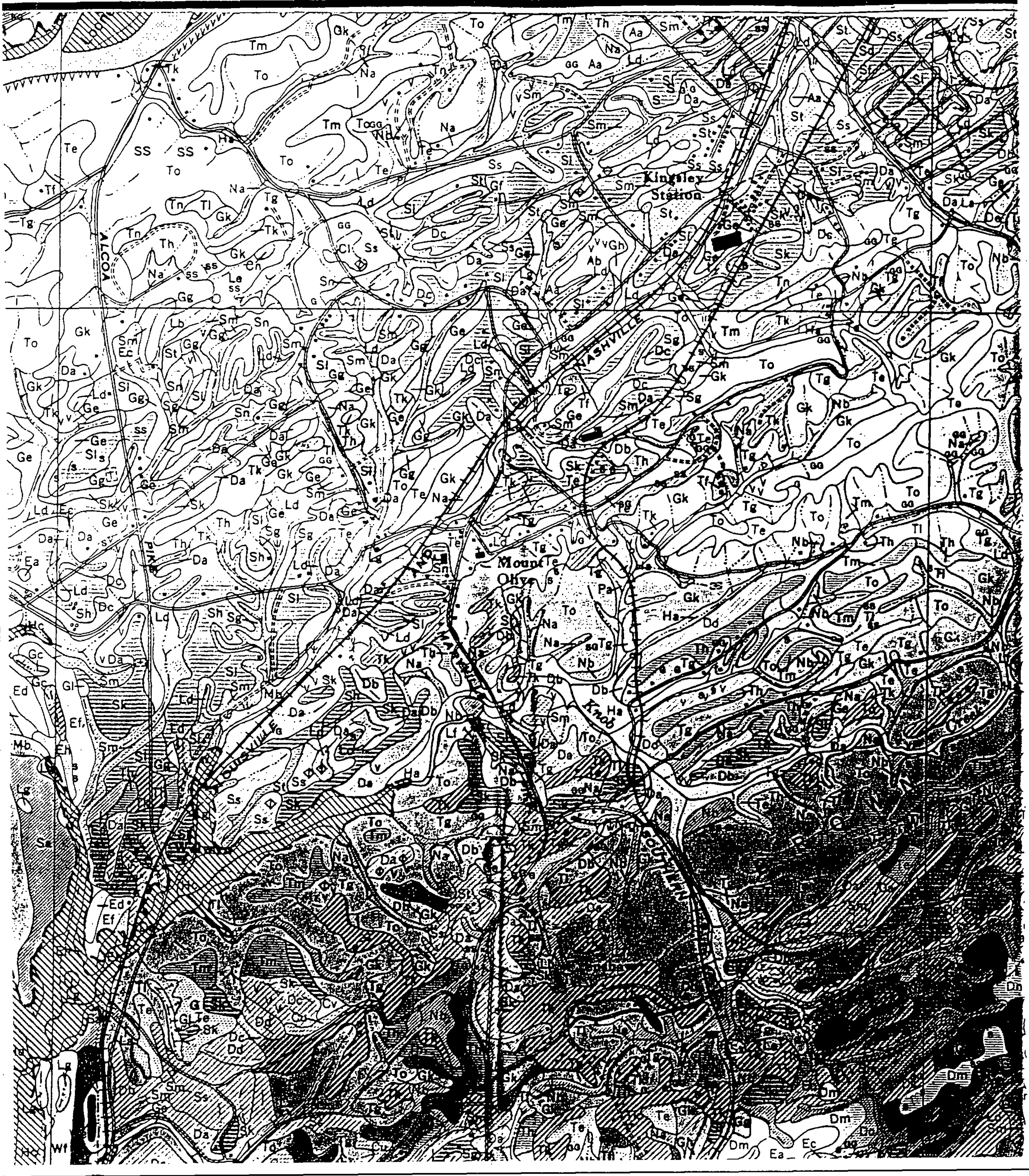
Middle

Fi

SOIL MAP

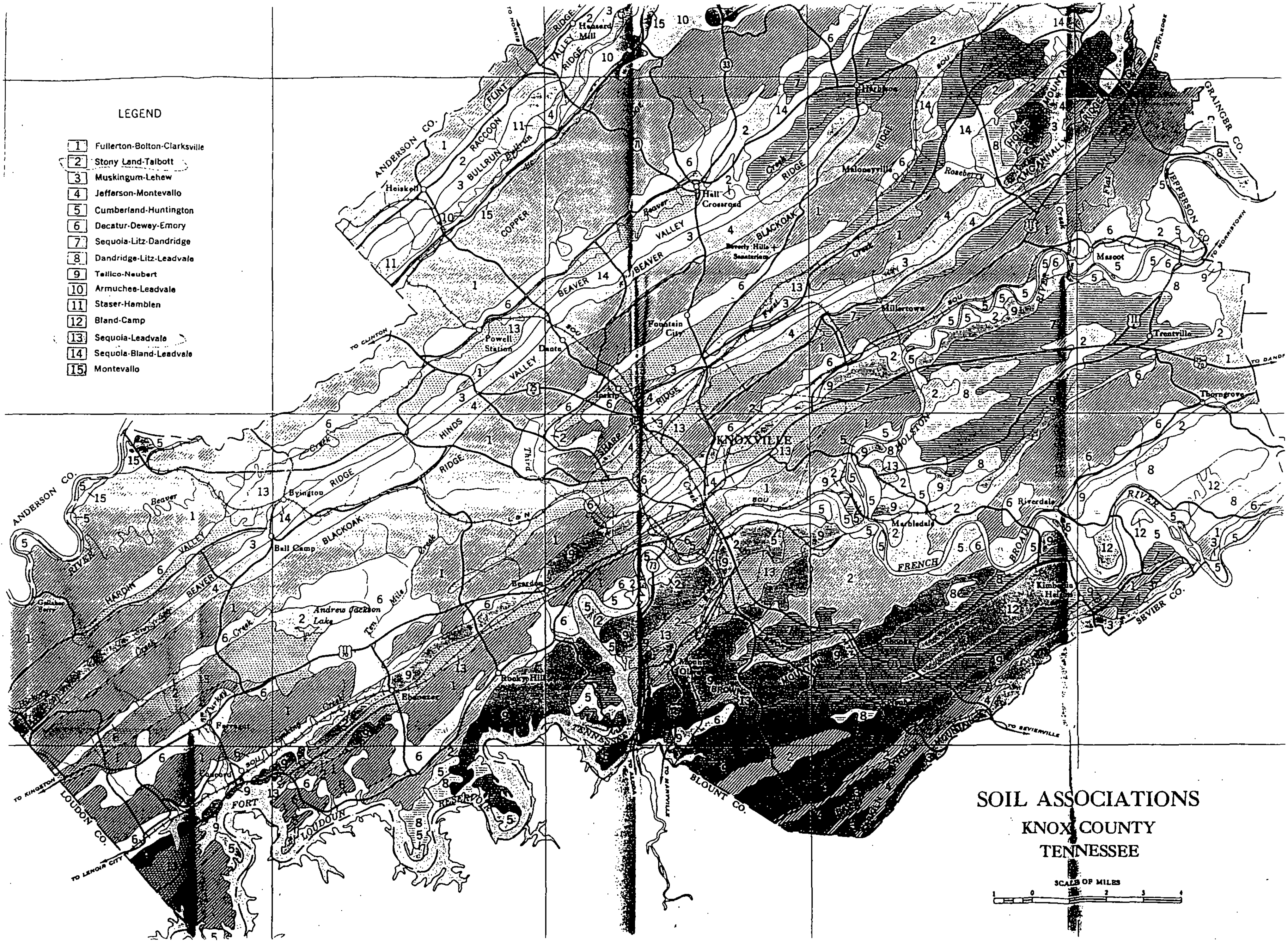
FIGURE 6

SOIL MAP
KNOX COUNTY - TENNESSEE
KNOXVILLE QUADRANGLE



Soil	Map symbol	Management requirement group[1]	Dominant slope range	Soil profile: Color of surface soil[2]	Soil profile: Color, texture, and consistence of subsoil or substratum[3]	Depth[4]	Nature of parent rock or parent material	Permeability: Surface soil	Permeability: Subsoil	Runoff	Moisture relations[5]	Erosion hazard[6]	Use suitability group[7]
			Percent			*Feet*							
Ar ... land:													
...inuebee and Litz soil materials	Ga	3-A	12-50	Surface soil largely lacking; exposed soil material variable (see text description).	Variable (see text description)	½-2	Shale and interbedded limestone and shale.	Slow	Slow	Very high	Very poor	Extremely great	6
...ullerton and Talbott soil materials	Gr	3-A	12-50	do		1-30	Limestone and cherty limestone	do	do	do	do	do	5
...quoia and Montevallo soil materials	Gs	3-A	4-12	do			Shale	Moderately slow	Moderately slow	do	do	do	5
...albott and Decatur soil materials	Gw	3-A	4-12	do		1-30	High grade and clayey (argillaceous) limestones.	Very slow	Very slow	do	do	do	5
...illico and Muskingum soil materials	Gx	3-A	12-50	do		1-10	Acid and calcareous sandstones	Moderately slow	Moderately slow	do	do	do	5
...e silt loam	Gt	2-E	0-2	Gray	Gray mottled, very firm clay	10-30	Local alluvium chiefly from Fullerton, Talbott, Colbert, and Sequoia soil areas.	do	Very slow	None	Poor	None (overflows)	4
...en fine sandy loam	Ha	1-B	0-3	Brownish to reddish brown	Yellowish-brown to reddish-brown silt loam or sandy loam, mottled below 20 inches.	5-30	General alluvium containing much sand.	Moderately rapid	Moderate	do	Very good	do	[illegible]
...len silt loam	Hb	1-B	0-2	Light yellowish brown	Yellowish-brown to reddish-brown silt loam or silty clay loam, mottled below 20 inches.	5-30	General alluvium, much from shale.	Moderate	do	do	do	do	2
...ngton silt loam	Hc	1-A	0-2	Brown or dark brown	Brown or light-brown friable silt or silty clay loam.	15-40	General alluvium, strongly influenced by limestone.	do	do	do	do	do	1
...ow-bottom phase	Hd	1-A	0-2	Brown or dark grayish brown	Brown or dark grayish-brown silt loam or loam.	10-30	do	do	do	do	do	do	1
...on loam, eroded rolling phase	Jb	1-H	5-12	Yellowish gray	Brownish-yellow friable firm sandy clay loam.	2-12	Colluvium from sandy rocks	Moderately rapid	Moderately slow	Medium	Fair	Great	3
...on and Montevallo loams:													
...roded undulating phases	Jc	1-G	2-5	Grayish yellow (Jefferson) and yellowish gray (Montevallo).	Brownish-yellow friable sandy clay loam (Jefferson) and brownish-yellow friable shaly clay loam—lacking in places (Montevallo).	1-3 (Jefferson) and ½-2 (Montevallo)	Colluvium from sandy rocks (Jefferson) and acid shale (Montevallo).	Moderate	do	Low	do	Moderate	3
...roded rolling phases	Jd	1-H	5-12	do		1-3 (Jefferson) and ½-2 (Montevallo)	do	Moderately slow	do	High	Poor	Great	3
...son and Montevallo clay loams, severely ...ded rolling phases.	Ja	2-A	5-12	Brownish yellow (both soils)		1-3 (Jefferson) and ½-2 (Montevallo)	do	do	do	do	Very poor	Very great	4
...ale and Cotaco loams:													
...ndulating phases	La	1-D	0-7	Yellowish gray	Yellowish grading to mottled, friable (Cotaco) and firm (Leadvale) clay loam.	4-15	Mixed colluvium and local alluvium from sandstone and shale.	Moderate	do	Very low	Very good	Very little	2
...Rolling phases	Lb	1-D	7-16	do		3-10	do	do	do	Low	Good	Little	3
...ale and Whitesburg silt loams:													
...ndulating phases	Ls	1-D	0-7	Brownish gray (Whitesburg) and yellowish gray (Leadvale).	Yellowish grading to mottled, firm silty clay loam (both soils).	4-15	Colluvium and local alluvium chiefly from acid shale (Leadvale) and calcareous shale (Whitesburg).	do	do	Very low	Very good	Very little	2
...Rolling phases	Lc	1-D	5-12	do	do	3-10	do	do	do	Low	Good	Little	3
...stone rockland:													
...Rolling and hilly	Lm	3-A	2-25	Limestone rock exposed	Limestone rock	0	Limestone			Very high	Very poor	Extremely great	5
...Steep	Lp	3-A	25+	do	do	0	do			do	do	do	5
Lindside silt loam	Lo	1-B	0-2	Brown	Mottled friable to firm silt or silty clay loam.	5-40	General alluvium strongly influenced by limestone.	Moderate	Moderately slow	None	Very good	None (overflows)	2
...land	Ma	3-A	0-15	Variable	Variable	Variable	Variable						5
...lo silt loam	Mb	2-E	0-2	Brownish gray, mottled	Mottled firm to plastic silty clay	5-40	General alluvium strongly influenced by limestone.	do	Slow	None	Variable	None (overflows)	4
...tevallo silt loam, steep phase	Mc	3-A	25+	Grayish yellow or gray	Brownish-yellow friable shaly silt loam or shaly silty clay loam.	1-2	Acid shale	Moderately slow	Moderately slow	Very high	Poor	Extremely great	5
...tevallo shaly silt loam:													
Eroded steep phase	Mm	3-A	25+	do	Variegated partly disintegrated shale	0-1	do	do	do	do	do	do	5
Eroded hilly phase	Md	3-A	12-25	Yellowish gray	Brownish-yellow friable shaly silt loam or shaly silty clay loam.	1-2	do	do	do	do	do	Very great	5
Eroded rolling phase	Me	2-A	5-12	Grayish yellow	Brownish-yellow friable shaly silt loam or shaly silty clay loam for	½-1½	do	do	do	High	Fair to poor	Great	4

Undulating phase	Nb	1-C	2–5	Reddish brown	Brownish-red friable clay loam	3–20	Local alluvium and colluvium from Tellico soils.	Moderately rapid	do	Very low	Very good	Very little	1
Rolling phase	Na	1-C	5–15	do	do	3–20	do	do	do	Low	Good	Little	2
chucky gravelly loam, eroded rolling phase	No	1-H	5–12	Pale brown or gray	Reddish-yellow firm sandy clay	5–40	Mixed alluvium	do	do	do	Fair	Moderate	3
ewah silt loam	Oa	1-B	0–2	Grayish brown	Mottled friable to firm silty clay loam	10–30	Local alluvium from soils over limestone.	Moderate	Moderately slow	None	Very good	None (overflows)	2
ler silt loam	Pa	2-E	0–2	Light gray, mottled	Mottled gray firm to compact clay	5–30	General alluvium chiefly from shale.	do	Slow	do	Poor	do	4
ne silt loam	Ra	1-C	0–2	Grayish brown	Yellowish brown or yellowish-gray friable silty clay loam underlain by light-gray cherty matrix.	4–15	General alluvium from cherty limestone.	Moderately rapid	Moderate to variable.	Very low	Fair to poor	Very little	2
atchie fine sandy loam	Sa	1-C	2–12	do	Yellowish-brown friable sandy clay loam.	10–40	Moderately young general alluvium, sandy.	do	do	do	Good	do	2
oia silt loam, undulating phase	Sb	1-J	2–5	Brownish gray	Reddish-yellow very firm silty clay	1½–3½	Interbedded shale and limestone or calcareous (limy) shale.	Moderate	Slow	Medium	do	Moderate	2
oia silty clay loam:													
Eroded undulating phase	Sl	1-J	2–5	Brownish gray to grayish yellow	do	1–3	do	do	do	do	Fair	do	2
Severely eroded undulating phase	Sn	1-L	2–5	Reddish yellow	do	½–2	do	Slow	do	High	Poor	Great	3
oia silt loam, rolling phase	So	1-K	5–12	Brownish gray	do	1½–2½	do	Moderate	do	do	Fair	do	2
oia silty clay loam:													
Eroded rolling phase	Sk	1-K	5–12	Brownish yellow	do	1–2	do	Moderately slow	do	do	do	do	3
Severely eroded rolling phase	Sm	2-A	5–12	Reddish yellow	do	½–1½	do	Slow	do	Very high	Very poor	Very great	4
oia-Bland silty clay loams:													
Eroded undulating phase	So	1-J	2–5	Grayish yellow (Sequoia) and weak red (Bland).	Reddish-yellow (Sequoia) and dusky-red (Bland) firm silty clay.	1–3½	Interbedded shale and limestone (Sequoia) and dusky red shaly limestone (Bland).	Moderate	do	Medium	Fair	Moderate	2
Eroded rolling phase	Sq	1-K	5–12	do	do	½–2	do	Moderately slow	do	High	do	Great	3
Severely eroded rolling phase	Sr	2-A	5–12	Reddish yellow (Sequoia) and dusky red (Bland).	do	½–1½	do	Slow	do	Very high	Very poor	Very great	4
Eroded hilly phase	Ss	2-C	12–25	Grayish yellow (Sequoia) and weak red (Bland).	do	½–2	do	Moderately slow	do	do	Fair	do	4
Severely eroded hilly phase	Se	2-C	12–25	Reddish yellow (Sequoia) and dusky red (Bland).	do	½–1½	do	Slow	do	do	Very poor	Extremely great	4
r silt loam	Sa	1-A	0–2	Grayish brown	Light-brown friable silt loam	5–30	General alluvium; much from shale.	Moderate	Moderate	None	Very good	None (overflows)	1
r fine sandy loam	So	1-A	0–3	Light brown	Light-brown friable fine sandy loam.	25–35	General alluvium; contains much sand.	Rapid	Rapid	do	Good	do	2
Low-bottom phase	Sp	1-A	0–3	Grayish brown or brown	do	5–25	do	do	do	do	Very good	do	1
y rolling land, Colbert and Talbott soil materials.	Sr	2-A	7–15	Limestone outcrops with grayish-brown silty clay loam over plastic clay between.		0–3	Limestones, chiefly clayey (argillaceous).	Slow	Very slow	High	Fair	Very great	4
y hilly and steep land, Colbert and Talbott soil materials.	Ss	3-C	15–45	do		0–2	do	Very slow	do	Very high	Poor	Extremely great	4
y very steep land, Muskingum soil material.	Sq	3-A	40+	Sandstone outcrops with light-yellow sandy material between		0–1½	Sandstone	do	do	do	do	do	5
ott silty clay loam:													
Eroded undulating phase	Tb	1-J	2–5	Grayish brown	Red plastic clay	3–6	Clayey (argillaceous) limestone.	Moderately slow	Slow	Medium	Fair	Great	2
Eroded rolling phase	Ta	1-K	5–12	do	do	3–6	do	do	do	High	do	do	2
Severely eroded rolling phase	Td	2-A	5–12	Red	do	1½–5	do	Slow	do	Very high	Very poor	Very great	4
Severely eroded hilly phase	Tc	3-C	12–25	do	do	1–4	do	do	do	do	do	Extremely great	4
ico loam:													
Hilly phase	Tm	1-N	12–25	Light reddish brown	Dark-red friable to firm sandy clay	3–12	Calcareous sandstone	Moderately rapid	Moderate	Medium	Fair	Moderate	3
Eroded hilly phase	Tn	1-N	12–25	do	do	3–12	do	do	do	High	do	do	3
ico clay loam, severely eroded hilly phase	Tb	2-B	12–25	Dark red	do	2–10	do	Moderate	do	Very high	Poor	Great	4
ico loam:													
Steep phase	To	3-A	25+	Light reddish brown	do	2–9	do	Moderately rapid	do	do	do	Very great	5
Eroded steep phase	Tl	3-A	25+	do	do	1½–8	do	do	do	do	do	do	5
ico clay loam, severely eroded steep phase	Te	3-A	25+	Dark red	do	1–8	do	Moderate	do	do	Very poor	Extremely great	5
ico loam:													
Rolling phase	Th	1-H	5–12	Light reddish brown	do	4–12	do	Moderately rapid	do	Medium	Good	Little	2
Eroded rolling phase	Tk	1-H	5–12	Reddish brown	do	4–12	do	do	do	do	do	Moderate	3
ico clay loam, severely eroded rolling phase	Tf	1-I	5–12	Dark red	do	2–10	do	Moderate	do	High	Poor	Very great	3
r silt loam	Ty	2-E	0–2	Gray	Gray, mottled with yellow, very firm silty clay.	5–40	Mixed general alluvium	do	Very slow	None	do	Moderate	4
nesboro loam:													
Eroded undulating phase	Wb	1-E	2–5	Grayish brown	Red firm sandy clay	5–40	do	Moderately rapid	Moderately slow	Low	Good	Little	2
Eroded rolling phase	Wc	1-F	5–12	do	do	4–30	do	Moderate	do	Medium	Fair	Moderate	3
Eroded hilly phase	Wd	1-N	12–25	do	do	3–20	do	do	do	High	do	Great	3
nesboro clay loam, severely eroded hilly phase.	Wa	2-B	12–25	Red	do	3–15	do	Moderately slow	do	Very high	Poor	Very great	4
tover silty clay loam:													
Eroded undulating phase	Wr	1-E	2–5	Light brown	Yellowish-brown, grading to mottled, very firm silty clay.	10–40	do	Moderate	Slow	Medium	Fair	Moderate	3


SOIL ASSOCIATIONS
KNOX COUNTY
TENNESSEE
SCALE OF MILES
LEGEND
1 Fullerton-Bolton-Clarksville
2 Stony Land-Talbott
3 Muskingum-Lehew
4 Jefferson-Montevallo
5 Cumberland-Huntington
6 Decatur-Dewey-Emory
7 Sequoia-Litz-Dandridge
8 Dandridge-Litz-Leadvale
9 Tellico-Neubert
10 Armuchee-Leadvale
11 Staser-Hamblen
12 Bland-Camp
13 Sequoia-Leadvale
14 Sequoia-Bland-Leadvale
15 Montevallo
KNOXVILLE
ANDERSON CO.
GRAINGER CO.
JEFFERSON CO.
SEVIER CO.
BLOUNT CO.
LOUDON CO.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

LEGEND [illegible]
KNOX CO[illegible]
TENN[illegible]

SOIL MANAGEMENT GROUPING

NEARLY LEVEL WELL-DRAINED SOILS ON BOTTOM LANDS AND IN DEPRESSIONS; SUITED TO INTENSIVE CROPPING, BUT SUBJECT TO OVERFLOW

MANAGEMENT GROUP 1-A

[illegible]

NEARLY LEVEL IMPERFECTLY DRAINED SOILS ON BOTTOM LANDS AND IN DEPRESSIONS; SUITED TO INTENSIVE CROPPING, BUT SUBJECT TO OVERFLOW

MANAGEMENT GROUP 1-B

[illegible]

UNDULATING AND ROLLING, DEEP, WELL-DRAINED SOILS ON LOW STREAM TERRACES OR LOCAL ALLUVIUM; SUITED TO RELATIVELY INTENSIVE CROPPING UNDER GOOD MANAGEMENT

MANAGEMENT GROUP 1-C

[illegible]

IMPERFECTLY DRAINED SOILS ON COLLUVIUM OR LOCAL ALLUVIUM; BEST SUITED TO GENERAL FARM CROPS INCLUDING PASTURE LEGUMES AND GRASSES

MANAGEMENT GROUP 1-D

[illegible]

UNDULATING WELL-DRAINED CHIEFLY RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-E

[illegible]

ROLLING WELL-DRAINED RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A FAIRLY WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-F

[illegible]

UNDULATING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER GOOD MANAGEMENT

MANAGEMENT GROUP 1-G

[illegible]

ROLLING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER VERY CAREFUL MANAGEMENT

MANAGEMENT GROUP 1-H

[illegible]

HILLY RED SOILS OF LIMESTONE VALLEYS AND HIGH STREAM TERRACES, DEEP TO BEDROCK; SUITED TO GENERAL CROPS AND PASTURE, BUT DIFFICULT TO MAINTAIN

MANAGEMENT GROUP 1-M

[illegible]

HILLY LIGHT-COLORED SOILS, DEEP OR MODERATELY DEEP TO BEDROCK; LIMITED SUITABILITY FOR TILLED CROPS

MANAGEMENT GROUP 1-N

[illegible]

ROLLING SOILS VERY SHALLOW TO CLAYEY SUBSOIL, BEDROCK, OR BOTH; POORLY SUITED TO TILLED CROPS

MANAGEMENT GROUP 2-A

[illegible]

HILLY AND STEEP RED SOILS, MODERATELY TO SEVERELY ERODED, DROUGHTY; POORLY SUITED TO TILLED CROPS AND LIMITED SUITABILITY FOR PASTURE

MANAGEMENT GROUP 2-B

[illegible]

HILLY AND STEEP SOILS, SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; UNSUITED TO TILLED CROPS, FAIR TO GOOD FOR PASTURE

MANAGEMENT GROUP 2-C

[illegible]

HILLY LIGHT-COLORED SOILS DEEP TO BEDROCK, CHERTY OR SEVERELY ERODED, DROUGHTY, POORLY SUITED TO MOST CROPS, FAIR FOR PASTURE

MANAGEMENT GROUP 2-D

[illegible]

POORLY DRAINED SOILS; POORLY SUITED TO CROPS, FAIRLY GOOD FOR PASTURE WHEN DRAINED AND WELL MANAGED

MANAGEMENT GROUP 2-E

[illegible]

SOILS POORLY SUITED TO CROPS OR PASTURE

MANAGEMENT GROUP 3-A

[illegible]

Landisburg and Whitesburg silt loams, rolling phases
Landisburg and Whitesburg silt loams, undulating phases

UNDULATING WELL-DRAINED CHIEFLY RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-E

- Alcoa silt loam, eroded undulating phase
- Cumberland silty clay loam, eroded undulating phase
- Decatur silt loam, undulating phase
- Decatur silty clay loam, eroded undulating phase
- Dewey silt loam, undulating phase
- Dewey silty clay loam, eroded undulating phase
- Etowah silt loam, undulating phase
- Etowah silty clay loam, eroded undulating phase
- Farragut silty clay loam, eroded undulating phase
- Waynesboro loam, eroded undulating phase
- Waynesboro silty clay loam, eroded undulating phase

ROLLING WELL-DRAINED RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A FAIRLY WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-F

- Alcoa silt loam, eroded rolling phase
- Bolton silt loam, eroded rolling phase
- Cumberland gravelly fine sandy loam, eroded rolling phase
- Cumberland silty clay loam, eroded rolling phase
- Decatur silt loam, rolling phase
- Decatur silty clay loam, eroded rolling phase
- Dewey silt loam, rolling phase
- Dewey silty clay loam, eroded rolling phase
- Etowah silty clay loam, eroded rolling phase
- Farragut silty clay loam, eroded rolling phase
- Waynesboro loam, eroded rolling phase

UNDULATING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER GOOD MANAGEMENT

MANAGEMENT GROUP 1-G

- Fullerton loam, eroded undulating phase
- Fullerton loam, undulating phase
- Fullerton silt loam, eroded undulating phase
- Fullerton silt loam, undulating phase
- Jefferson and Montevallo loams, eroded undulating phases

ROLLING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER VERY CAREFUL MANAGEMENT

MANAGEMENT GROUP 1-H

- Clarksville cherty silt loam, eroded rolling phase
- Clarksville cherty silt loam, rolling phase
- Fullerton cherty silt loam, eroded rolling phase
- Fullerton cherty silt loam, rolling phase
- Fullerton loam, eroded rolling phase
- Fullerton loam, rolling phase
- Fullerton silt loam, eroded rolling phase
- Fullerton silt loam, rolling phase
- Greendale cherty silt loam, rolling phase
- Greendale silt loam, rolling phase
- Jefferson and Montevallo loams, eroded rolling phases
- Jefferson loam, eroded rolling phase
- [illegible] gravelly loam, eroded rolling phase
- Tellico loam, eroded rolling phase
- Tellico loam, rolling phase

ROLLING WELL-DRAINED RED SOILS WITH HEAVY PLOW LAYERS AND SUBSOILS; BEST SUITED TO CLOSE-GROWING CROPS AND PASTURE

MANAGEMENT GROUP 1-I

- Bolton silty clay loam, severely eroded rolling phase
- Cumberland silty clay loam, severely eroded rolling phase
- Decatur silty clay loam, severely eroded rolling phase
- Dewey silty clay loam, severely eroded rolling phase
- Fullerton silty clay loam, severely eroded rolling phase
- Tellico clay loam, severely eroded rolling phase
- Waynesboro silty clay loam, eroded rolling phase

UNDULATING SOILS WITH HEAVY SUBSOILS, MODERATELY SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; BEST SUITED TO CLOSE-GROWING CROPS AND PASTURE

MANAGEMENT GROUP 1-J

- Colbert silty clay loam, eroded undulating phase
- Sequoia-Bland silty clay loams, eroded undulating phases
- Sequoia silt loam, undulating phase
- Sequoia silty clay loam, eroded undulating phase
- Talbott silty clay loam, eroded undulating phase

ROLLING SOILS WITH HEAVY SUBSOILS, MODERATELY SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; BEST SUITED TO CLOSE-GROWING CROPS

MANAGEMENT GROUP 1-K

- Bland silt loam, rolling phase
- Bland silty clay loam, eroded rolling phase
- Colbert silty clay loam, eroded rolling phase
- Sequoia-Bland silty clay loams, eroded rolling phases
- Sequoia silt loam, rolling phase
- Sequoia silty clay loam, eroded rolling phase
- Talbott silty clay loam, eroded rolling phase

UNDULATING SOILS VERY SHALLOW TO BEDROCK SHALE; LOW IN FERTILITY, DROUGHTY, AND OF LIMITED SUITABILITY FOR CROPS

MANAGEMENT GROUP 1-L

- Montevallo shaly silt loam, eroded undulating phase
- Sequoia silty clay loam, severely eroded undulating phase

- Etowah silty clay loam, severely eroded hilly phase
- Tellico clay loam, severely eroded hilly phase
- Waynesboro clay loam, severely eroded hilly phase

HILLY AND STEEP SOILS, SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; UNSUITED TO TILLED CROPS, FAIR TO GOOD FOR PASTURE

MANAGEMENT GROUP 2-C

- Armuchee silt loam, steep phase
- Armuchee silty clay loam, eroded hilly phase
- Armuchee silty clay loam, eroded steep phase
- Bland silty clay loam, eroded hilly phase
- Colbert silty clay, severely eroded hilly phase
- Dandridge and Litz shaly silt loams, eroded hilly phases
- Dandridge and Litz silt loams, hilly phases
- Dandridge and Litz silt loams, steep phases
- Dandridge shaly silt loam, eroded hilly phase
- Dandridge shaly silt loam, eroded steep phase
- Dandridge silt loam, steep phase
- Farragut silty clay loam, eroded hilly phase
- Sequoia-Bland silty clay loams, eroded hilly phases
- Sequoia-Bland silty clay loams, severely eroded hilly phases
- Stony hilly and steep land, Colbert and Talbott soil materials
- Talbott silty clay loam, severely eroded hilly phase

HILLY LIGHT-COLORED SOILS DEEP TO BEDROCK, CHERTY OR SEVERELY ERODED, DROUGHTY; POORLY SUITED TO MOST CROPS, FAIR FOR PASTURE

MANAGEMENT GROUP 2-D

- Clarksville cherty silt loam, eroded hilly phase
- Clarksville cherty silt loam, hilly phase
- Fullerton cherty silt loam, eroded hilly phase
- Fullerton cherty silt loam, hilly phase
- Fullerton cherty silty clay loam, severely eroded hilly phase
- Fullerton silty clay loam, severely eroded hilly phase

POORLY DRAINED SOILS; POORLY SUITED TO CROPS, FAIRLY GOOD FOR PASTURE WHEN DRAINED AND WELL MANAGED

MANAGEMENT GROUP 2-E

- Guthrie silt loam
- Melvin silt loam
- Prader silt loam
- Tyler silt loam

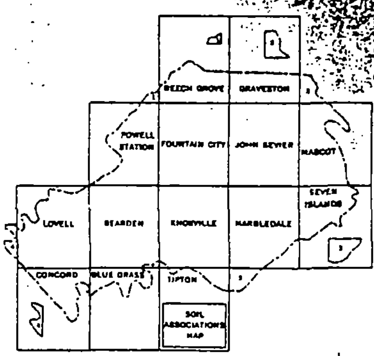
SOILS POORLY SUITED TO CROPS OR PASTURE

MANAGEMENT GROUP 3-A

- Bland silt loam, steep phase
- Bland silty clay loam, eroded steep phase
- Clarksville cherty silt loam, eroded steep phase
- Clarksville cherty silt loam, steep phase
- Dandridge and Litz shaly silt loams, eroded steep phases
- Fullerton cherty silt loam, eroded steep phase
- Fullerton cherty silt loam, steep phase
- Fullerton cherty silty clay loam, severely eroded steep phase
- Gullied land, Armuchee and Litz soil materials
- Gullied land, Fullerton and Talbott soil materials
- Gullied land, Sequoia and Montevallo soil materials
- Gullied land, Talbott and Decatur soil materials
- Gullied land, Tellico and Muskingum soil materials
- Limestone rockland, rolling and hilly
- Limestone rockland, steep
- Made land
- Montevallo shaly silt loam, eroded hilly phase
- Montevallo shaly silt loam, eroded steep phase
- Montevallo silt loam, steep phase
- Muskingum-Lehew fine sandy loams, eroded hilly phases
- Muskingum-Lehew fine sandy loams, eroded steep phases
- Muskingum-Lehew fine sandy loams, hilly phases
- Muskingum-Lehew fine sandy loams, steep phases
- Muskingum stony fine sandy loam, steep phase
- Stony very steep land, Muskingum soil material
- Tellico clay loam, severely eroded steep phase
- Tellico loam, eroded steep phase
- Tellico loam, steep phase

Bland silty clay loam, eroded hilly phase
Bland silty clay loam, eroded rolling phase
Bland silty clay loam, eroded steep phase
Bolton silt loam, eroded hilly phase
Bolton silt loam, eroded rolling phase
Bolton silt loam, eroded steep phase
Bolton silty clay loam, severely eroded hilly phase
Bolton silty clay loam, severely eroded rolling phase
Bolton silty clay loam, severely eroded steep phase
Camp silt loam
Chewacla silt loam
Clarksville cherty silt loam, eroded hilly phase
Clarksville cherty silt loam, eroded rolling phase
Clarksville cherty silt loam, eroded steep phase
Clarksville cherty silt loam, hilly phase
Clarksville cherty silt loam, rolling phase
Clarksville cherty silt loam, steep phase
Colbert silty clay, severely eroded hilly phase

DIAGRAM
Showing arrangement of sheets



G. Kenneth Abbott, Chief Soil Correlator.
C. K. Barnes, Chief Analyst, Soil Uses and Productivity.
Roy W. Simonson, Principal Soil Correlator, Southern States.
Correlation and inspection by H. J. Edwards, Soil Scientist.

WETLANDS MAPS

FIGURE 7

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

LOUISVILLE, TENN.

CHATTANOOGA
WATTS BAR LAKE

LOUISVILLE, TENN.

SCALE 1:24000

1 acre · 10 acres · 20 acres
ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:
Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. **Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.**

SYMBOLOGY EXAMPLE

SYSTEM
SUBSYSTEM
CLASS
L2EM2F
SUBCLASS WATER REGIME
UPLAND (NON WETLAND)
R2OWH
(LINEAR DEEPWATER HABITAT)

U – Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*)
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *Italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

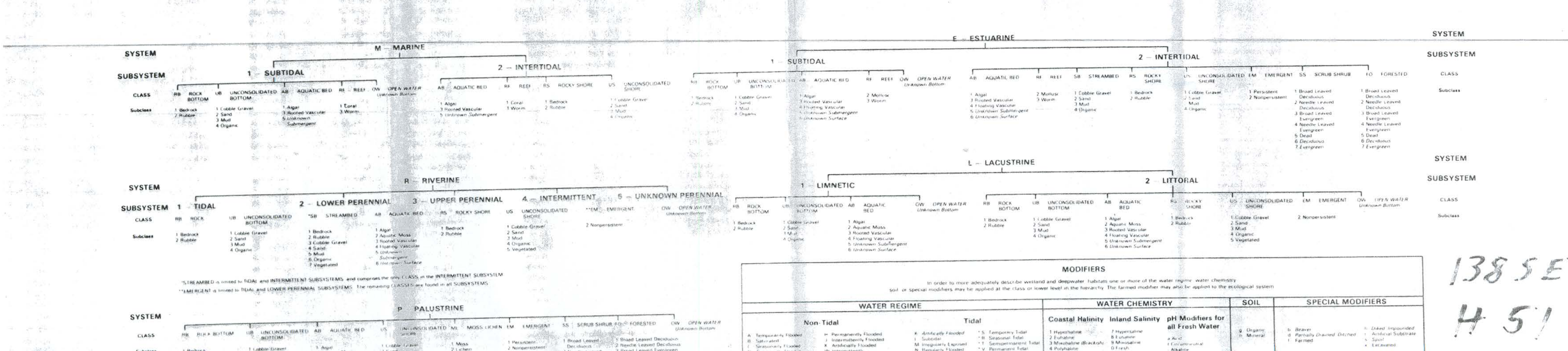
AERIAL PHOTOGRAPHY

DATE 3 / 81 · DATE
SCALE 1:58 000 · SCALE
TYPE CIR · TYPE

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

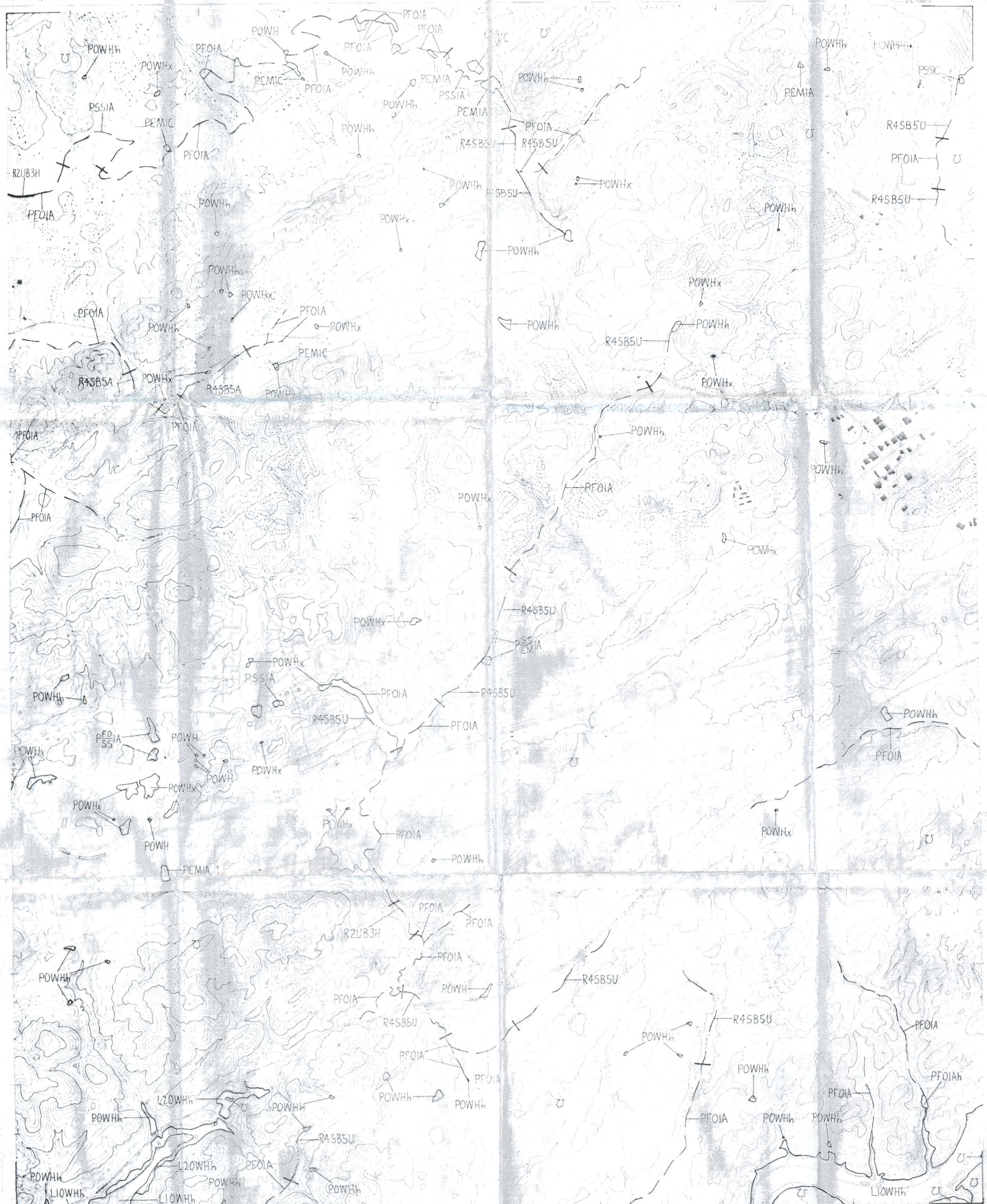


138 SE
451

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

BEARDEN, TENN.



CHATTANOOGA NE

WATTS BAR LAKE

BEARDEN, TENN.

SCALE 1:24 000

□ 1 acre

10 acres

20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available For information, contact

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS OBS 79 31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition there is a margin of error inherent in the use of the aerial photographs. Thus a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. **Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.**

SYMBOLOGY EXAMPLE

L2EM2F

R2OWH

Ʊ – Primarily represents **upland** areas but may include unclassified wetlands such as man modified areas, non photo identifiable areas and or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*)
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *Italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach Bar (BB) or Flat (FL). Subclasses remain the same in both versions.

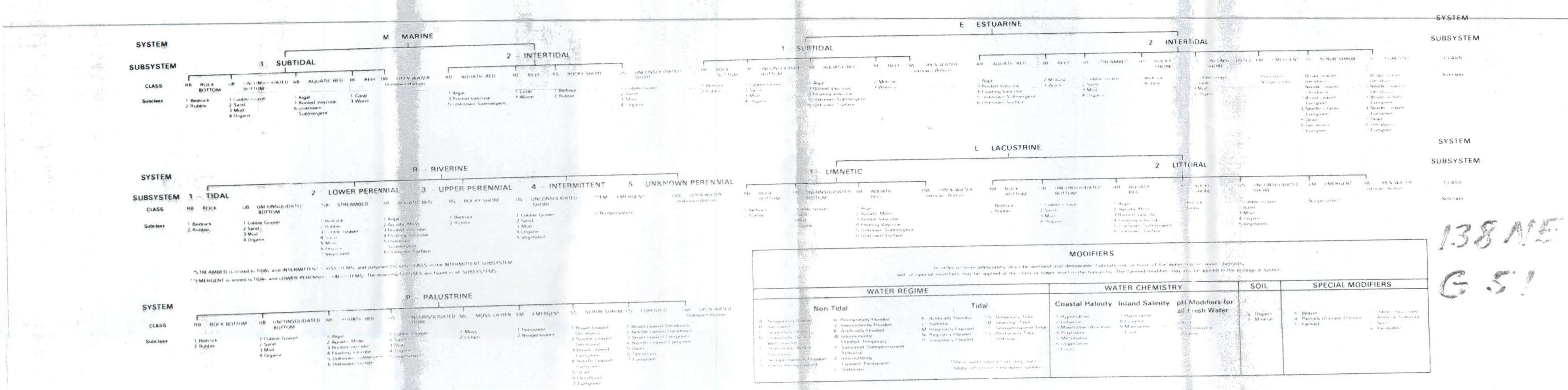
AERIAL PHOTOGRAPHY

DATE	3 81	DATE	
SCALE	1:58 000	SCALE	
TYPE	CIR	TYPE	

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory



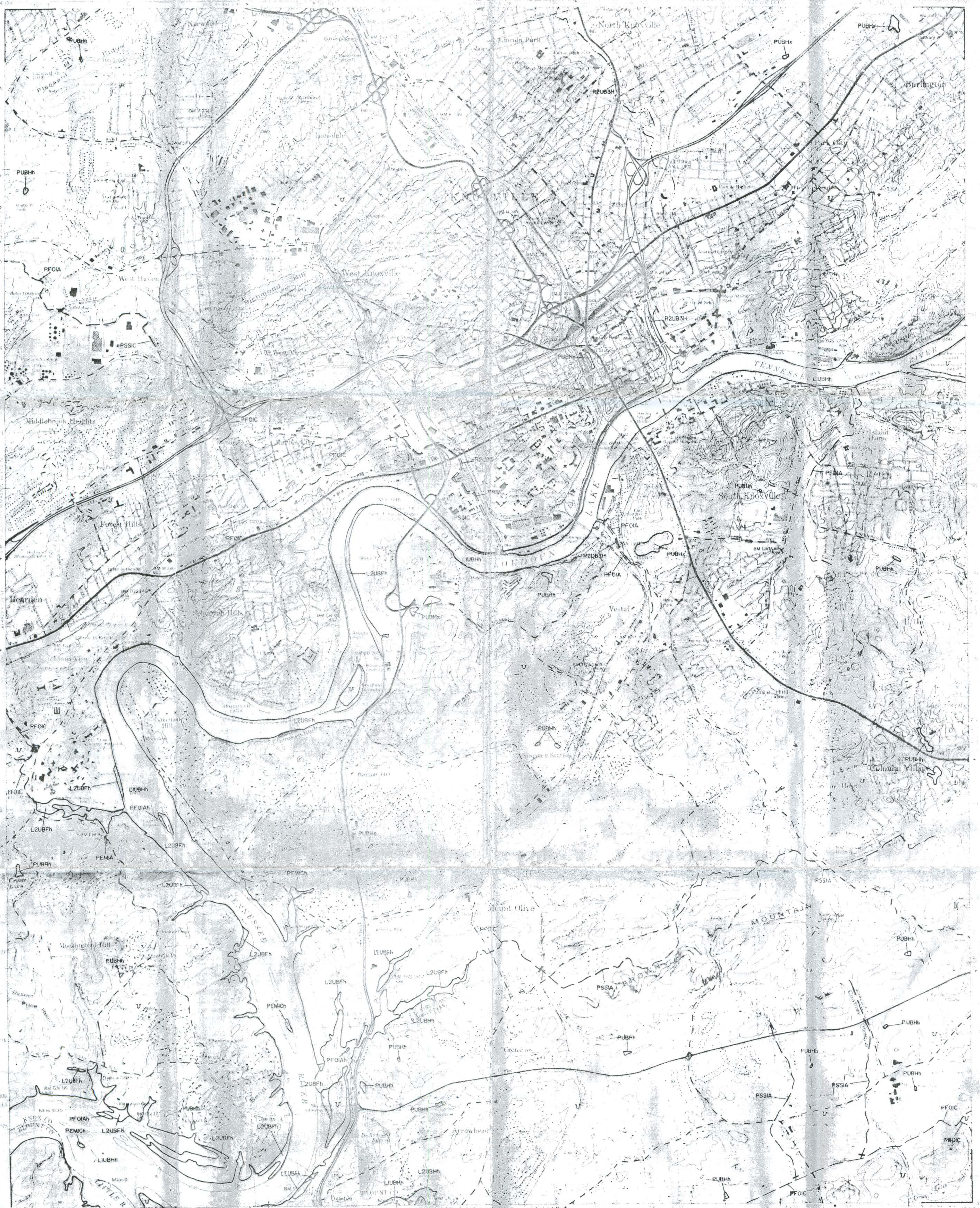
138 NE

G 51

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

KNOXVILLE, TENN.



KNOXVILLE NW

KNOXVILLE

KNOXVILLE, TENN.

SCALE 1:24 000

1 MILE — 7000 FEET — 1 KILOMETER

1 acre — 10 acres — 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with Classification of Wetlands and Deepwater Habitats of the United States (FWS/OBS - 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

SYMBOLOGY EXAMPLE

SYSTEM
SUBSYSTEM
CLASS
L2EM2F
SUBCLASS WATER REGIME
UPLAND (NON-WETLAND)
R2OWH
(LINEAR DEEPWATER HABITAT)

U — Primarily represents **upland** areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

AERIAL PHOTOGRAPHY

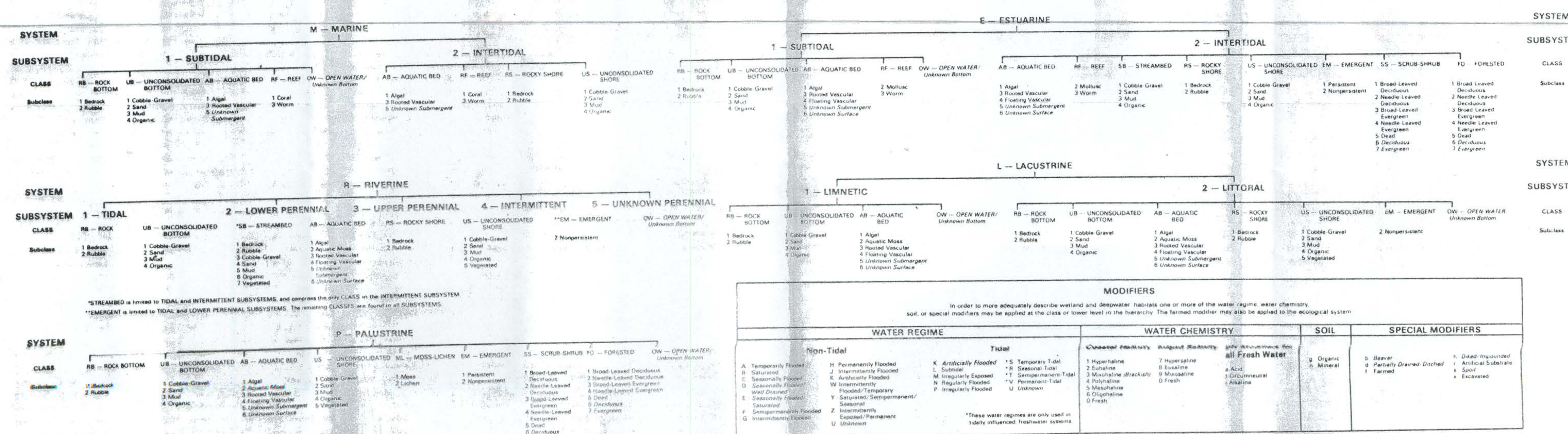
DATE 4/ /85 — DATE
SCALE 1:58 000 — SCALE
TYPE CIR — TYPE

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

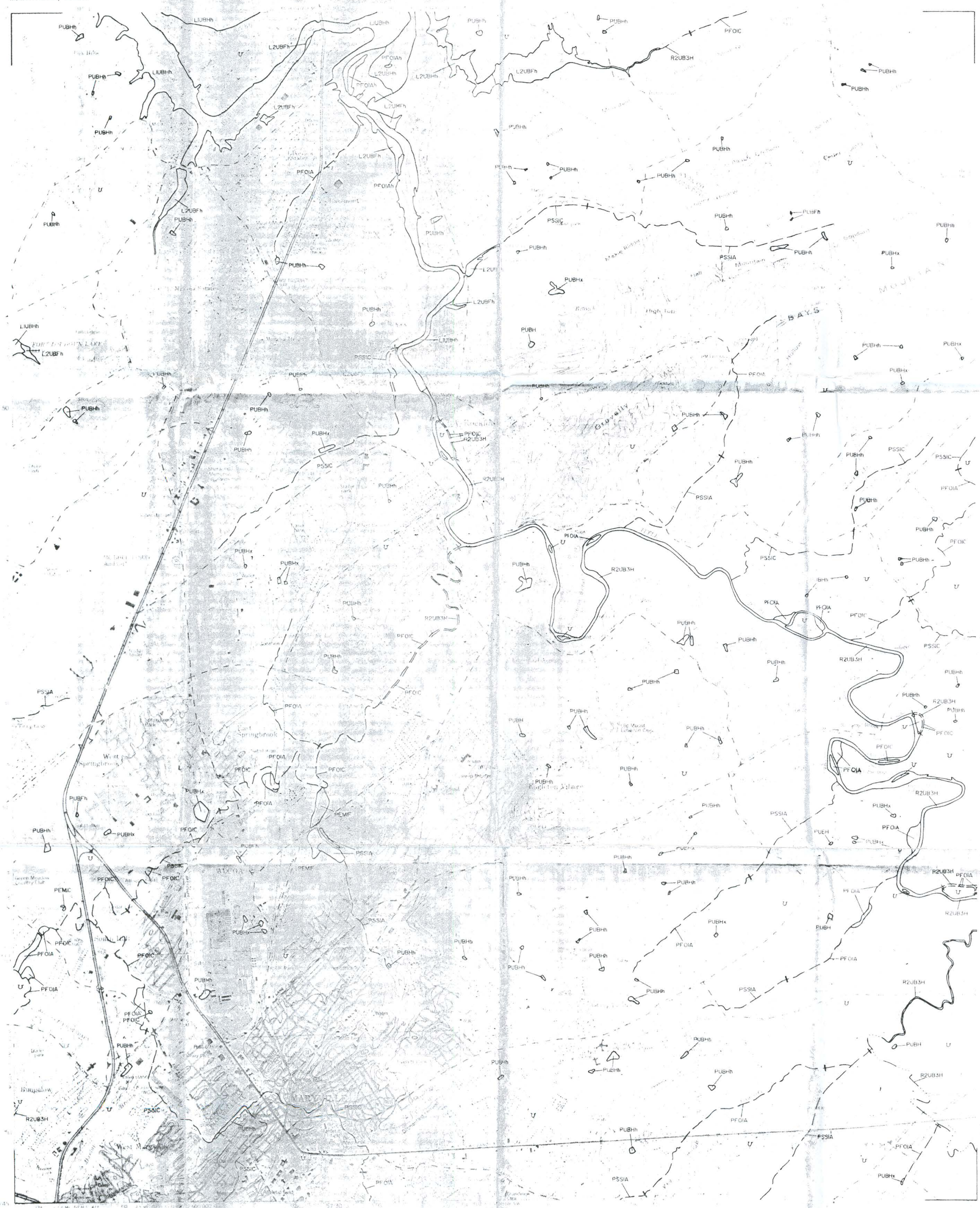
1989



NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

MARYVILLE, TENN.



KNOXVILLE NW

KNOXVILLE

MARYVILLE, TENN.

SCALE 1:24 000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

1 acre 10 acres 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

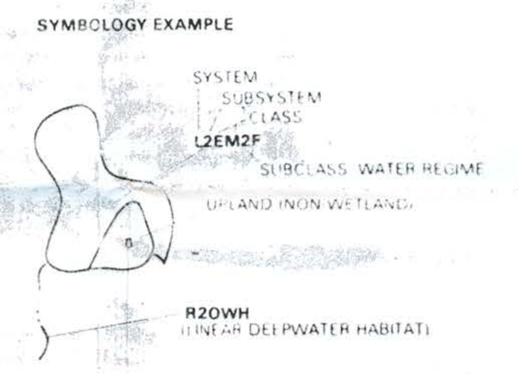
Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS - 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. **Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.**

SYMBOLOGY EXAMPLE



U — Primarily represents **upland** areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

AERIAL PHOTOGRAPHY

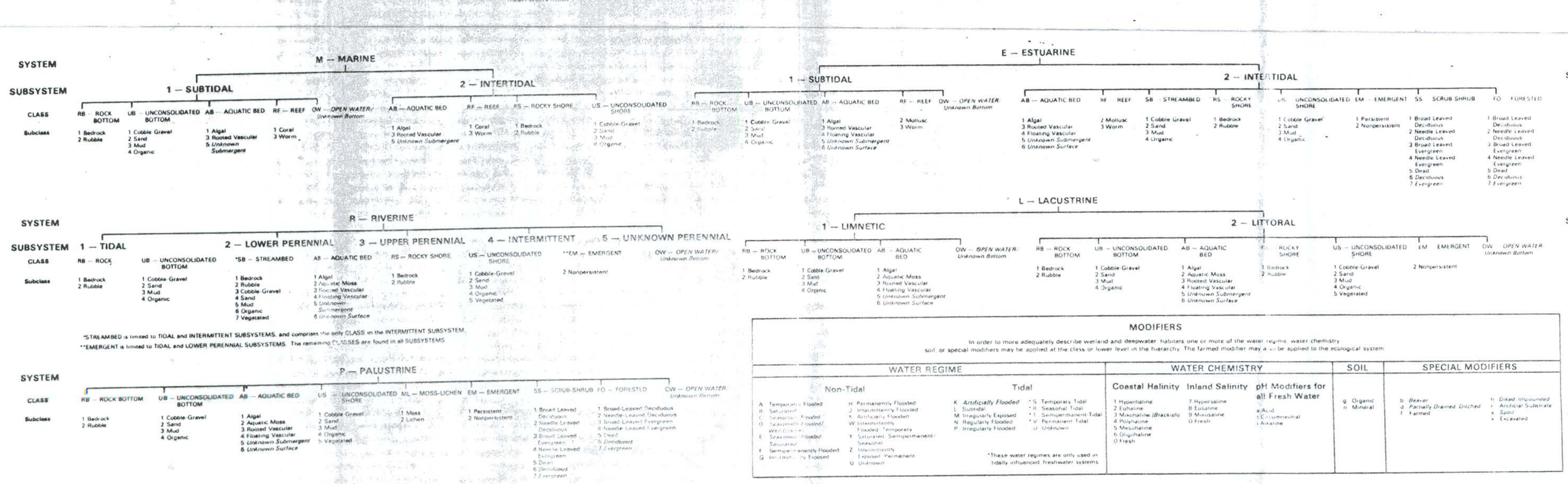
DATE	4/ /85	DATE	
SCALE	1:58 000	SCALE	
TYPE	CIR	TYPE	

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

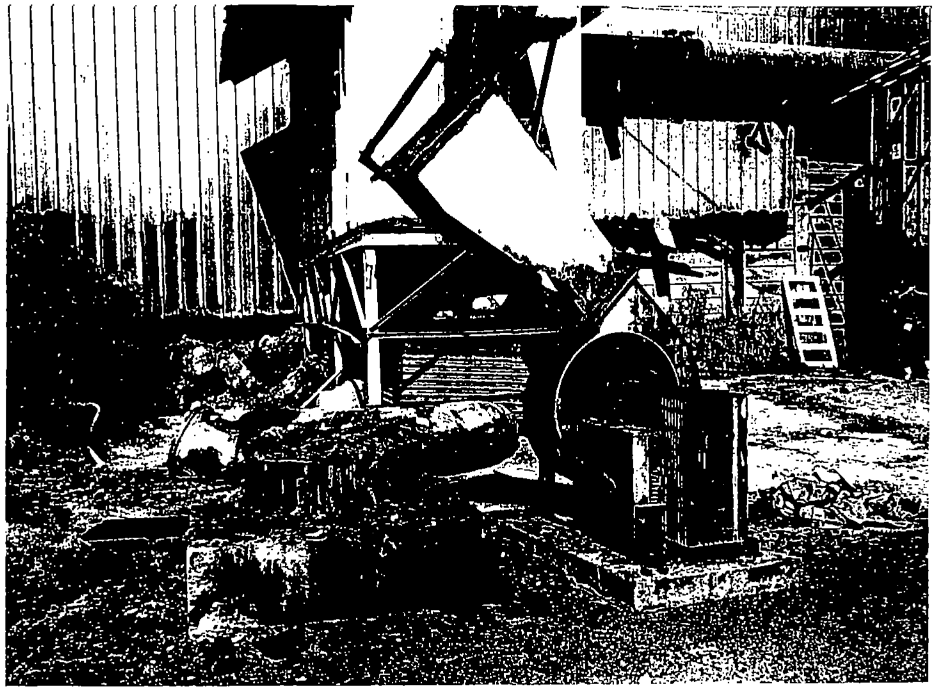
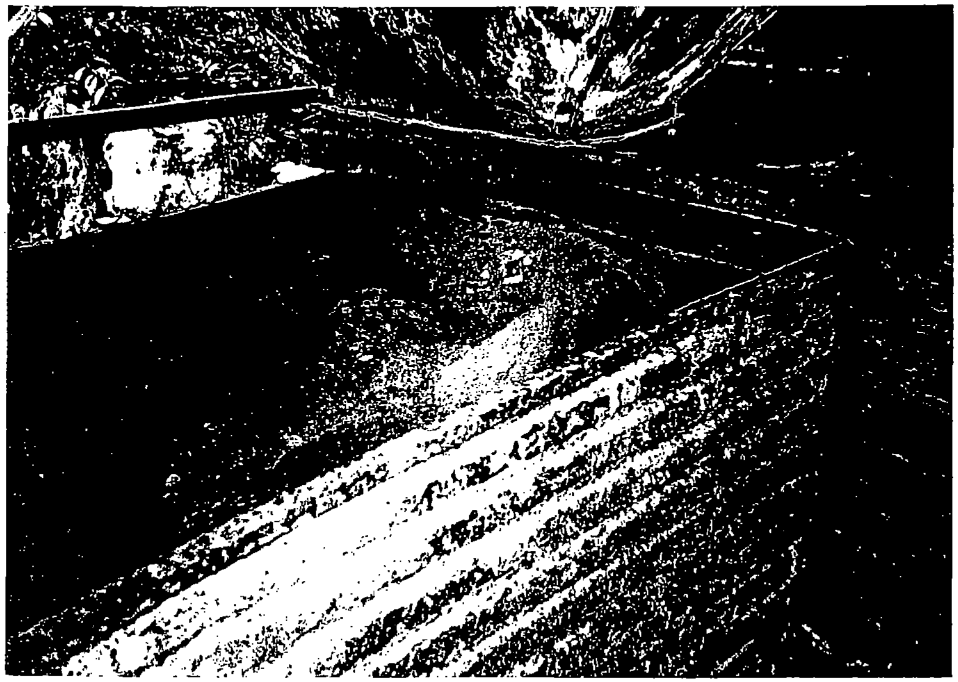
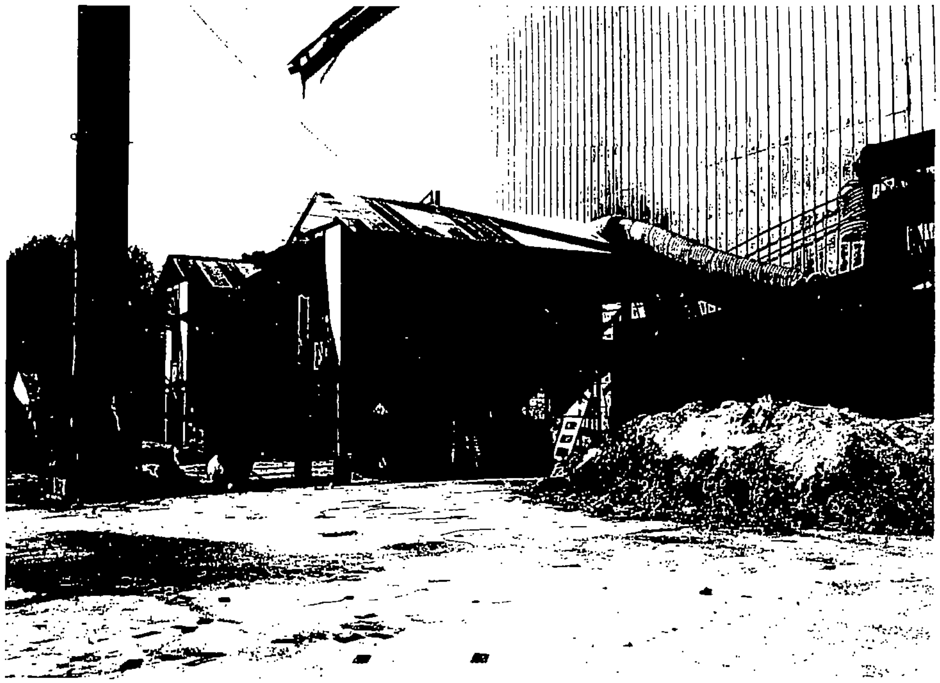
1989



• LIST OF SELECTED PHOTOGRAPHS •

SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE KNOXVILLE, TENNESSEE 37920 U.S. EPA # TND098071061 TSDF #47-559

1	View of main building, taken from north entrance.
2	Baghouse smokestack base (smokestack has fallen away), fan, and baghouse.
3	Close-up view of one of the metal hoppers beneath one of the two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (Sample WA-02).
4	Close-up view of two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (WA-02).
5	Lagoon and surrounding area. Locations of Samples PDT-01, PDT-02, and PDT-03
6	SSW view of waste piles from the lagoon area. Location of Sample WA-04, PDT-05, and PDT-06.
7	Two baghouses at SE side of S corner of main building.
8	NW waste pile near NW drainage at SW edge of Site. Location of Sample PDT-07.
9	Blue substance in NW waste pile near NW drainage at SW edge of Site. Location of Sample WA-01.
10	Looking downstream in NW drainage at SW edge of Site.
11	Pile of drums at SW edge of Site, looking downstream in SW drainage - location of Sample SD-01
12	NW edge of pile of drums at SW edge of Site.
13	SE edge of pile of drums at SW edge of Site.
14	Waste pile inside southwest end of main building. Location of Samples WA-03 and PDT-04.
15	One of the two gas-fired rotary furnaces.
16	The casting furnace and, in the background, a waste pile inside the northeast end of the main building.

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 6 PHOTO TAKEN BY: Burl H. Maupin

LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Chris A. Andel

REMARKS: Baghouse smokestack base (smokestack has fallen away), fan, and baghouse.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 2
PHOTO TAKEN BY: Burl H. Maupin

LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Chris A. Andel

REMARKS: View of main building, taken from north entrance.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 9 PHOTO TAKEN BY: Burl H. Maupin

LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Chris A. Andel

REMARKS: Close-up view of two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (# WA-02).

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 8 PHOTO TAKEN BY: Burl H. Maupin

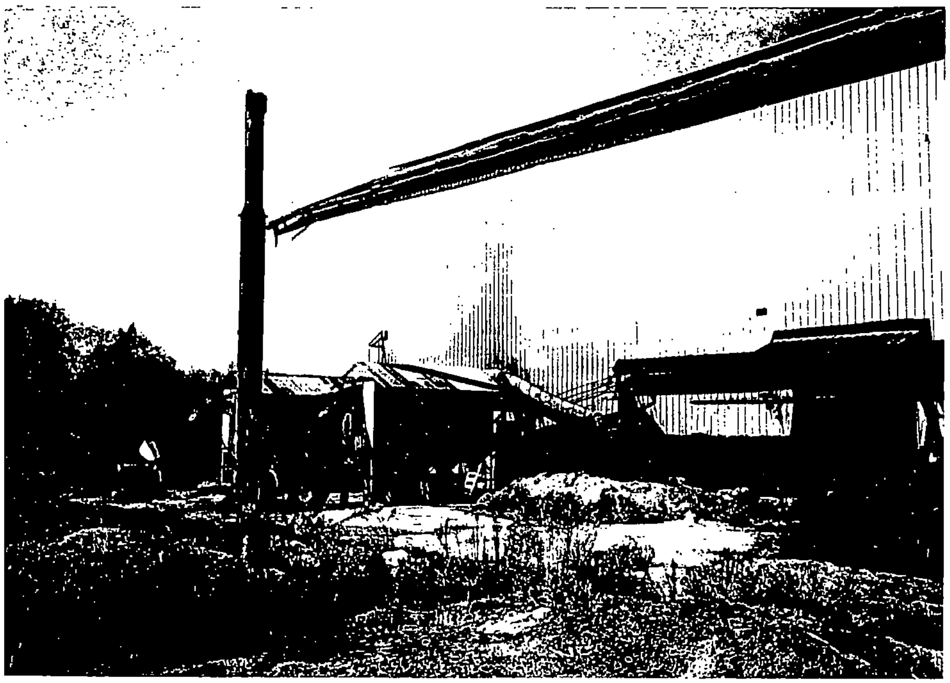
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Chris A. Andel

REMARKS: Close-up view of one of the metal hoppers beneath one of the two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (Sample # WA-02).

SIGNATURE: Burl H Maupin






DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 11 PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: SSW view of waste piles from the lagoon area. Location of Sample # WA-04, PDT-05, and PDT-06.
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

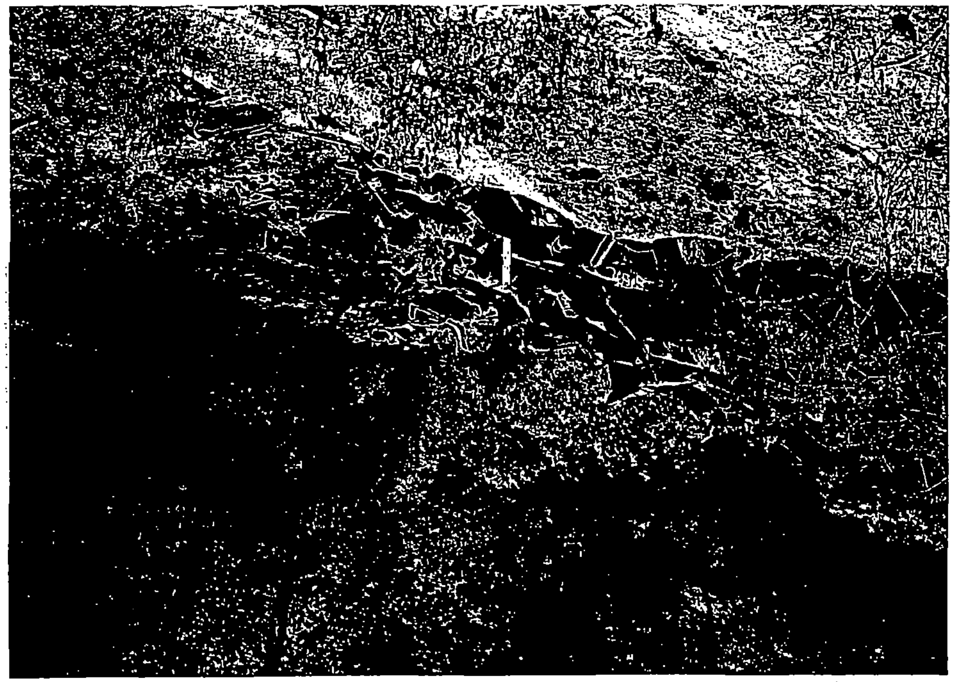
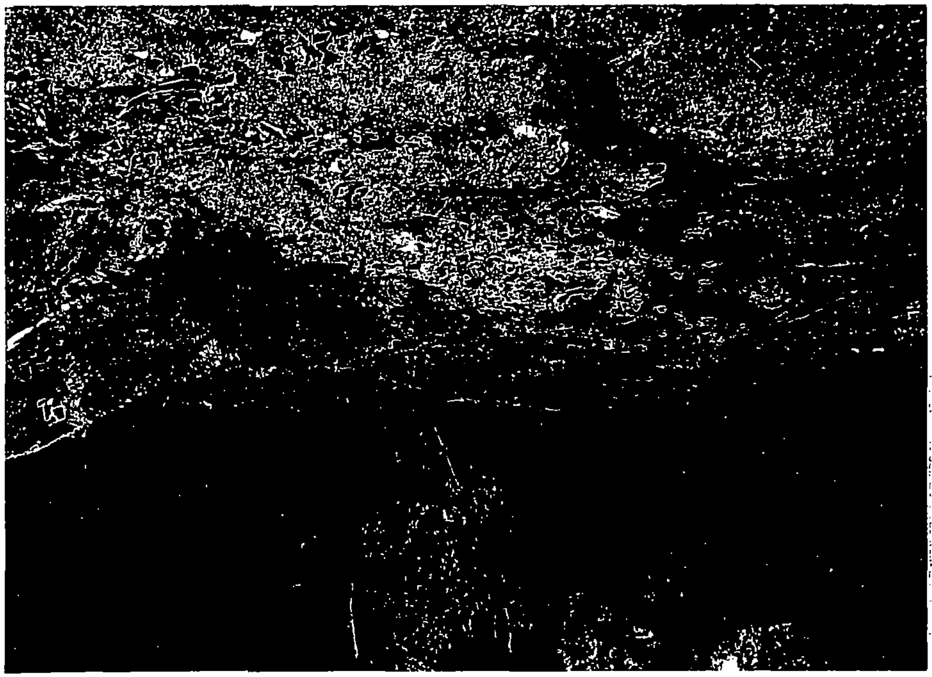
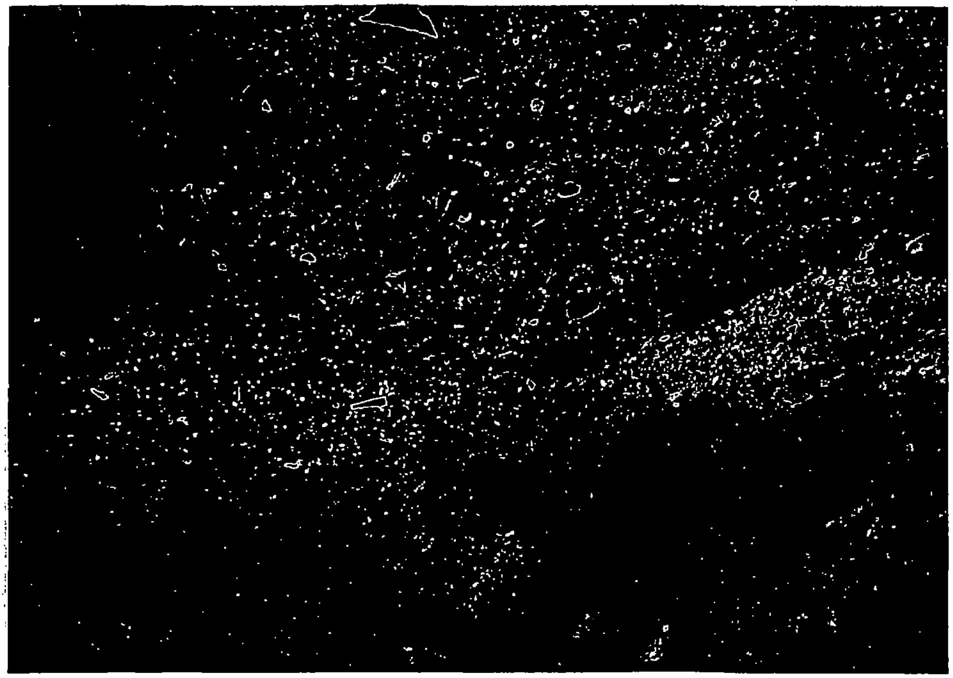
DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 10
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Lagoon and surrounding area. Locations of Samples PDT-01, PDT-02, and PDT-03.
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 13
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: NW waste pile near NW drainage at SW edge of Site. Location of Sample # PDT-07
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 12 PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Two baghouses at SE side of S corner of main building.
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 15
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Looking downstream in NW drainage at SW edge of Site.
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

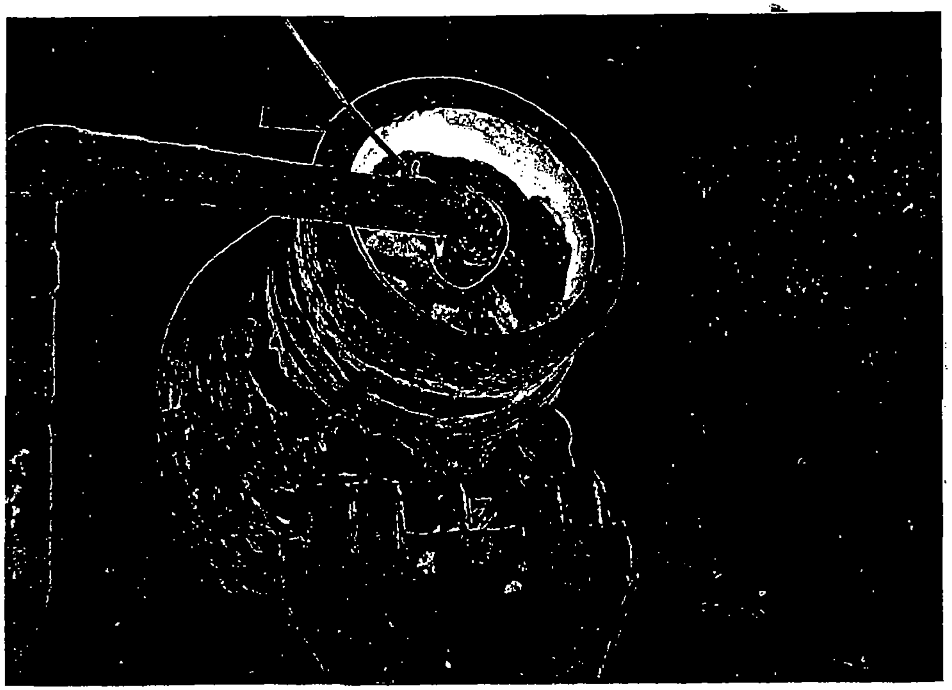
DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 14
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Blue substance in NW waste pile near NW drainage at SW edge of Site. Location of Sample # WA-01.
SIGNATURE: Burl H Maupin

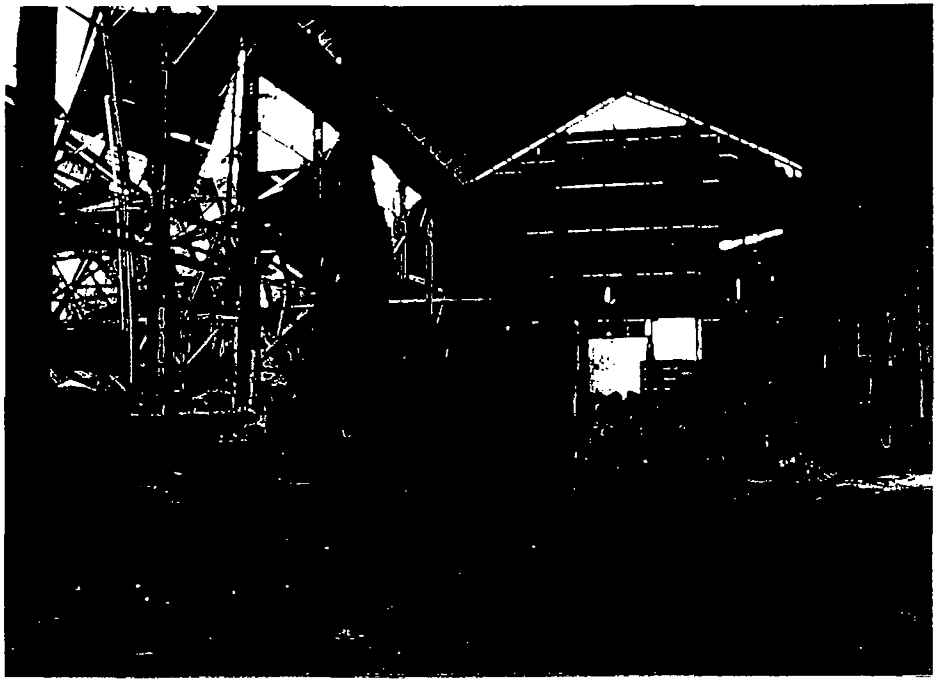
DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 18
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: NW edge of pile of drums at SW edge of Site.
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 17
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Pile of drums at SW edge of Site, looking downstream in SW drainage - location of Sample # SD-01
SIGNATURE: Burl H Maupin





DIVISION OF SUPERFUND

DATE OF PHOTO: October 29, 1997
PHOTO NUMBER: 3
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Adam DeWeese
REMARKS: Waste pile inside southwest end of main building. Location of Samples WA-03 and PDT-04.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 29, 1997
PHOTO NUMBER: 10
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Adam DeWeese
REMARKS: The casting furnace and, in the background, a waste pile inside the northeast end of the main building.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 21
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: SE edge of pile of drums at SW edge of Site.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 29, 1997
PHOTO NUMBER: 7
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Adam DeWeese
REMARKS: One of the two gas-fired rotary furnaces.

SIGNATURE: Burl H Maupin

PROPERTY DEEDS
AND
OWNERSHIP CARDS

APPENDIX 1

SMOKEY MOUNTAIN SMELTERS

1508 MARYVILLE PIKE

KNOXVILLE, TENNESSEE 37920

U.S. EPA # TND098071061

TDSF #47-559

APPENDIX 1

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	1		1508 MARYVILLE PK

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
	-	-	-	234.7 X 763.3 X IRR	0.00 - A.C. Deeded

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	2		CALEB RD

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
JOSEPH LEWIS 1ST ADD	-	1-	7-99	166.4 X 57 X IRR	0.00 - A.C. Deeded

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL

1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	3		1500 MARYVILLE PK

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
JOSEPH LEWIS 1ST ADD	-	-	7-99	144.67 X 304.52 X IRR	1.02 - A.C. Deeded

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	4		LEWIS AV

Owner	Deed Dates	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivisions	Block	Lot	Plat	Dimensions (shown in feet)	Acreage
JOSEPH LEWIS 1ST ADD	-	12-	-	90 X 234.7 X IRR	0.00 - A.C. Deeded
		11-			0.45 0.00 - A.C. Calculate

INSTRUMENT NO. 3314

WARRANTY DEED—Form 14. This Instrument Prepared By Max M. Morrison, Attorney, ~~716 Market St., Knoxville,~~ Tenn.

THIS INDENTURE, made this 28 day of September

A. D., 19 79 between Jerry V. Sternberg, Single

of Asheville, in the State of North Carolina

of the first part, and David A. Witherspoon, Jr., and Daniel E. Johnson

of Knoxville, Tennessee the second part.

WITNESSETH, that the said part y of the first part, for and in consideration of the sum

of One Dollar ($1.00) and other good and valuable consideration

01* *1.00

to him in hand paid by the said part ies of the second part, the receipt of which is hereby acknowledged,

16552

10-30-79

2 000

~~and to secure the payment of said note as specified, hereby retained on the property herein conveyed,~~ has granted, bargained, sold, conveyed, and do es hereby grant, bargain, sell and convey unto the said part ies of the second part, the following described premises, to wit, situated in District No. Nine of Knox County, Tennessee

All property described in the attached "Exhibit A" and "Exhibit A-1"

08* *390.00

09* *0

A *390.

16562

10-30-79

2 0001

I hereby swear or affirm that the actual consideration or value of this transfer, whichever is greater, is $150,000.00 Affiant

Subscribed and sworn to before me this 30 day of Oct 1979

Deputy Register B Way

RESPONSIBLE TAXPAYER

NAME 12206 Arrowhead PT Knoxville, TN 3792

ADDRESS

COUNTERSIGNED

OCT 30 1979

PARK M. (Parkey) STRADER

KNOX COUNTY

PROPERTY ASSESSOR

BY uk

I certify that the ... on the within ... Witness my hand this

OCT 30 1979

Du...

390.00

.50

390.50

BOOK 1691 PAGE 646

For further and more complete description and for Title, reference is here made to the following Deeds of Record in the Register's Office in and for said County and State, in Deed Book

Vol. , Page , Book , Vol. , Page , Book ,

Vol. , Page ;

with the hereditaments and appurtenances thereto appertaining, hereby releasing all claims to Homestead and Dower therein. TO HAVE AND TO HOLD the said premises to the said parties of the second part, their heirs and assigns forever.

And the said party of the first part for himself and for his Heirs, Executors and Administrators does hereby covenant with the said parties of the second part their heirs and assigns that they will lawfully seized in fee simple of the premises above conveyed and they have full power, authority and right to convey the same, that said premises are free from all incumbrances

and that he will forever warrant and defend the said premises and the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand and seal the day and year first above written.

Signed, sealed and delivered in the presence of

Jerry V. Sternberg (L. S.)
JERRY V. STERNBERG

(L. S.)

(L. S.)

(L. S.)

EXHIBIT "A"

Tracts of land located in Knox County, Tennessee, and being more fully described as follows:

Tract 1:

The following described property and premises, to-wit

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots 1, 10, 11, and 12 in the JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, all of said lots being more particularly bounded and described as shown on the map of said Addition aforesaid, to which Map reference is made for more particular description of said lots and as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date of October 23, 1958.

Tract 2:

The following described property and premises to-wit:

SITUATED, LYING, AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots No. 14 and 15 and the greater portion of Lot No. 16 in the JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, said lots and portion of lot lying adjacent forming one boundary situated and being on the Southeastern side of Lewis Avenue, having a combined frontage of 140 feet thereon and being more particularly bounded and described as follows to-wit:

BEGINNING at an iron pin in the Southeastern line of Lewis Avenue distant in a Northeasterly direction 50 feet from the point of intersection of the Southeastern line of Lewis Avenue with the Northeastern line of Bridge Street, extended to its point of intersection with said Southeastern line of Lewis Avenue, said point of beginning marking common corner to Lots No. 13 and 14 in said Addition; thence in a Northeasterly direction along the Southeastern line of Lewis Avenue 140 feet to an iron pin; thence in a Southeasterly direction on a line parallel with the common dividing line between Lots No. 16 and 17 and distant 10 feet Southwestwardly therefrom 191.72 feet to a cut in concrete in the Northwestern right-of-way line of the Southern Railroad; thence with said Railroad right-of-way line Southwestwardly 146.4 feet to an iron pin marking common corner to Lots No. 13 and 14, thence in a Northwesterly direction along the common dividing line between Lots No. 13 and 14, 212.2 feet to an iron pin in the Southeastern line of Lewis Avenue, the place of BEGINNING; as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 3:

The following described property and premises to-wit.

SITUATED, LYING, AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being generally bounded as follows: on the Northeast by the Joseph Lewis 1st Addition to Vestal, on the Southeast by the right-of-way of the Southern Railroad Company, on the Northwest by the right-of-way of the L. & N Railroad Company and on the Southwest by property known, on March 3, 1959 as the Mrs. Margaret Henniken Henniken tract, said property being more particularly bounded and described to-wit:

POOR ORIGINAL

BEGINNING at an iron pin in the Northwestern line of the Southern Railroad Company property, said point of beginning marking the most Southern corner of Lot No. 11 of the *Joseph Lewis 1st Addition to Vestal; thence North 36 degrees West along the Southwestern* line of said Addition and continuing along the Southwestern line of a driveway hereinafter described, a total distance of 603.46 feet to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad property the following chord calls and distances, to-wit: South 22 degrees 32 minutes West 70.37 feet to a point, South 24 degrees 33 minutes West 101.63 feet to a point, South 26 degrees 31 minutes West 101.69 feet to a point, South 28 degrees 28 minutes West 101.68 feet to a point, South 30 degrees 23 minutes West 101.74 feet to a point, South 32 degrees 28 minutes West 101.83 feet to a point, South 34 degrees 35 minutes West 101.68 feet to a point, South 36 degrees 05 minutes West 63.30 feet to a point marking the most Northern corner of said Mrs. Margaret Flenniken Flenniken tract; thence with said Northeastern line of said tract South 35 degrees 09 minutes East 638.30 feet to a point in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said Railroad right-of-way line North 27 degrees 40 minutes East 763.3 feet to an iron pin, the place of BEGINNING.

Together with a right-of-way extending from the most Northern portion of the above described property Northeastwardly to Bridge Street and Maryville Pike, said right-of-way being bounded on the Northwest by the L & N Railroad Company right-of-way, on the Southeast by Lot No. 1 of the Joseph Lewis 1st Addition to Vestal and Bridge Street, said right-of-way being approximately 21 feet in width and some 100 feet in length, all as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 5

BEGINNING at a point on the northwest side of Knoxville and Augusta Railway, southeast corner of the property now owned by the American Agricultural Chemical Company; thence northeast alongside Knoxville and Augusta railway property 53 feet more or less to a stake; thence in a northwest direction 213.14 feet, parallel to the northeast line of the American Agricultural Chemical Company's property to a stake; thence southwest running parallel with the said Knoxville and Augusta railway, 50 feet to a stake; the southeast corner of Bridge Street (now Caleb St.); thence southeast alongside line of said American Agricultural Chemical Co., 220.8 feet to the point of the BEGINNING. This being a part of the same property conveyed to Joseph Lewis, widower, by deed dated December 22, 1910, recorded in Book 246, page 240 of the Register's Office of Knox County, Tennessee.

This conveyance is made subject to a Southern Railway spur track across Tract 3; Easement for drainage ditches and water run-off in favor of the L & N Railroad Company and certain Restrictive Covenants applicable to Lots 14, 15, and 16, in the Joseph Lewis 1st Addition to Vestal.

POOR ORIGINAL

EXHIBIT "A-1"

A tract of land located in Knox County, Tennessee, and being more fully described as follows:

An undivided one-fifth (1/5) interest in and to the following described property and premises, to-wit:

SITUATED, LYING, AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, adjoining the last described tract herein on the Southwest, being known as a portion of the tract known on March 3, 1952, as the Mrs. Margaret Flenniken Flenniken tract, and being more particularly bounded and described, to-wit:

BEGINNING at a point in the Northwestern right-of-way line of the Southern Railroad Company property, distant South 27 degrees 40 minutes West measured along said Railroad right-of-way line 763.3 feet from an iron pin marking the most Southern corner of Lot No. 11 of the Joseph Lewis 1st Addition to Vestal; thence North 35 degrees 09 minutes West 635.30 feet to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad Company right-of-way line the following chord calls and distances, to-wit: South 36 degrees 05 minutes West 38.38 feet, South 39 degrees 30 minutes West 101.86 feet, South 40 degrees 24 minutes West 119.76 feet to an iron pin marking the most Northern corner of Lot No. 6 of the Joseph Lewis 3rd Addition to Vestal; thence along the Northeastern line of said Addition South 36 degrees 43 minutes East 686.44 feet to an iron pin in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said right-of-way line North 27 degrees 40 minutes East 260 feet to a point, the place of BEGINNING, as shown by survey of W. E. Lock, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

This conveyance is made subject to right-of-way along the Southwest line of this tract of land.

POOR ORIGINAL

STATE OF TENNESSEE, } ss.
County of KNOX }

Personally appeared before me, the undersigned authority, a Notary Public of said County and State, the within named bargainor Jerry V. Sternberg

with whom I am personally acquainted, and who ac[illegible]ged that he executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office this 28 day of SEPTEMBER A. D. 1979

My Commission Expires 6-28-82 [illegible signature] Notary Public.

STATE OF TENNESSEE, } ss.
County of ______ }

Personally appeared before me, ______, a Notary Public of said County and State, the within named bargainor ______

with whom I am personally acquainted, and who acknowledged that he executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office this ______ day of ______ A. D. 19 ___

My Commission Expires ______ ______ Notary Public.

STATE OF TENNESSEE
COUNTY OF ______

I, or we, hereby swear or affirm that the actual consideration for this transfer, or value of the property transferred, whichever is greater, is $ ______, which amount is equal to or greater than the amount which the property transferred would command at a fair, voluntary sale.

______

Subscribed and sworn to before me this ______ day of ______, 19 ___

My Commission Expires ______ ______ Notary Public.

DURWA[illegible] SHARP
REGIS[illegible]
NOTE BOOK
OCT 10 11 08 AM '79
RECEIVED FOR RECORDING

ATTORNEY AT LAW
2928 MAGNOLIA AVENUE
KNOXVILLE, TN 37914
523-7793

INSTRUMENT NO. 26229

THIS INDENTURE, made this 25TH. day of MAY A. D. 1984

between DAVID A. WITHERSPOON, JR. OF KNOX COUNTY in the State of TENNESSEE of the first part, and DANIEL E. JOHNSON

of KNOX COUNTY, TENNESSEE

of the second part.

01* *1200
08* *15600
09* *050
*16850
*16850
*168508
A *000
06-12-84
7177

WITNESSETH: That the said party of the first part, for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable consideration to him in hand paid by the said party of the second part, the receipt of which is hereby acknowledged,

I certify that the consideration tax on the within Deed has been paid.
Witness my hand this
JUN 12 1984
State Tax 156.00
Clerk Fee 1.50
156.50
Steve Hall
REGISTER OF DEEDS

COUNTERSIGNED
JUN 12 1984
PAM M. (Forkey) STRADER
KNOX COUNTY
PROPERTY ASSESSOR
BY 2B

STEVE HALL
RECEIVED FOR
BOOK
JUN 12 1 43 PM '84

has bargained, sold, remised, released, and QUIT-CLAIMED, and does hereby bargain, sell remise, release, and QUIT-CLAIM unto the said party of the second part,

the following described premises, to wit, situated in District No. Nine of Knox County, TN

Tract 1: The following described property and premises, to wit,

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots 1, 10, 11 and 12 in the JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, all of said lots being more particularly bounded and described as shown on the map of said Addition aforesaid, to which Map reference is made for more particular description of said lots and as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date of October 23, 1958.

Tract 2: The following described property and premises, to wit,

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots No 14 and 15 and the greater portion of Lot No. 16 in JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, said lots and portion of lot lying adjacent forming one boundary situated and being on the Southeastern side of Lewis Avenue, having a combined frontage of 140 feet thereon and being more particularly bounded and described as follows to-wit:

BOOK 1819 PAGE 688

BEGINNING at an iron pin in the Southeastern line of Lewis Avenue distant in a Northeasterly direction 50 feet from the point of intersection of the Southwestern line of Lewis Avenue with the Northeastern line of Bridge Street, extended to it's point of intersection with said Southeastern line of Lewis Avenue, said point of beginning marking common corner to Lots No. 13

and 14 in said Addition; thence in a Northeasterly direction along the Southeastern line of Lewis Avenue 140 feet to an iron pin; thence in a Southeasterly direction on a line parallel with the comm dividing line between Lots No. 16 and 17 and distant 10 feet Southwestwardly therefrom 191.72 feet to a cut in concrete in the Northwestern right-of-way line of the Southern Railroad; thence with sai Railroad right-of-way line Southwestwardly 146.4 feet to an iron pin marking common corner to Lots No. 13 and 14; thence in a Northwesterly direction along the common dividing line between Lots No. 13 and 14, 212.2 feet to an iron pin in the Southeastern line of Lewis Avenue, the place of BEGINNING, as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 3: The following described property and premises, to wit,

SITUATED, LYING AND BEING in the NINTH (9th.) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being generally bounded as follows: on the Northeast by the Joseph Lewis 1st Addition to Vestal, on the Southeast by the right-of-way of the Southern Railroad Company, on the Northwest by the right-of-way of the L & N Railroad Company and on the Southwest by property known, on March 3, 1959, as the Mrs. Margaret Flenniker Flenniken land, said property being more particularly bounded and described to-wit:

BEGINNING at an iron pin in the Northwestern line of the Southern Railroad Company property, said point of Beginning marking the most Southern corner of Lot No. 11 of the Joseph Lewis 1st Addition to Vestal; thence North 36 degrees West along the Southwestern line of said Addition and continuing along the Southwestern line of a driveway hereinafter described, a total distance of 608.46 feet to a point to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad property the following chord calls and distances, to wit: South 22 degrees 39 minutes West 70.37 feet to a point, South 24 degrees 33 minutes West 101.68 feet to a point, * South 28 degrees 28 minutes West 101.68 feet to a point, South 30 degrees 23 minutes West 101.74 feet to a point, South 32 degrees 28 minutes West 101.83 feet to a point, South 34 degrees 35 minute West 101.68 feet to a point, South 36 degrees 05 minutes West 63.30 feet to a point marking the mo: Northern corner of said Mrs. Margaret Flenniken Flenniken tract; thence with said Northeastern line of said tract South 35 degrees 09 minutes East 638.30 feet to a point in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said Railroad right-of-way line North 27 degrees 40 minutes East 763.3 feet to an iron pin, the place of BEGINNING

*South 26 de-:rees 31 minutes West 101.69 feet to a point,

Together with a right-of-way extending from the most Northern portion of the above described property Northeastwardly to Bridge Street and Maryville Pike, said right-of-way being bounded on the Northwest by the L & N Railroad Company right-of-way, on the Southeast by Lot No. 1 of the Josep Lewis 1st Addition to Vestal and Bridge Street, said right-of-way being approximately 21 feet in widt and some 100 feet in length, all as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 5:

BEGINNING at a point on the northwest side of Knoxville and Augusta Railway, southeast corner of the property now owned by the American Agricultural Chemical Company; thence northeast alongside Knoxville and Augusta Railway property 53 feet more or less to a stake; thence in a northwest direction 213.14 feet, parallel to the northeast line of the American Agricultural Chemical Company's property to a stake; thence southwest running parallel with the said Knoxville and Augusta railway, 50 feet to a stake; the southeast corner of Bridge Street (now Calab St.); thence southeast alongside line of said American Agricultural Chemical Co., 220.8 feet to the point of BEGINNING, This being a part of the same property conveyed to Joseph Lewis, widower, by deed dated December 22, 1910, recorded in Book 246, page 240 of the Register's Office of Knox County, Tennessee.

This conveyance is made subject to a Southern Railway spur track across Tract 3; Easement for drainage ditches and water run-off in favor of the L & N Railroad Company and certain Restrictive Covenants applicable to Lots 14, 15 and 16, in the Joseph Lewis 1st Addition to Vestal.

A tract of land located in Knox County, Tennessee, and being more fully described as follows:

An undivided one-fifth (1/5) interest in and to the following described property and premises, to-wit:

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, adjoining the last described tract herein on the Southwest, being known as a portion of the tract known on March 3, 1959, as the Mrs. Margaret Flenniken Flenniken tract, and being more particularly bounded and described , to-wit:

BEGINNING at a point in the Northwestern right-of-way line of the Southern RR Co. property, distan South 27 degrees 40 minutes West measured along said RR right-of-way line 763.3 feet from an iron pin marking the most Southern corner of Lot 11 of the Joseph Lewis 1st Addition to Vestal; thence North 35 degrees 09 minutes West 638.30 feet to a point in the Southeastern right-of-way line of the L & N RR Co. property; thence with said RR Co. right-of-way line the following chord calls and distances, to-wit: South 36 degrees 05 minutes West 38.38 feet, South 38 degrees 30 minutes West 101.86 feet, South 40 degrees 24 minutes West 119.76 feet to an iron pin marking the most Northern corner of Lot 6 of the Joseph Lewis 3rd Addition to Vestal; thence along the Northeastern line of said Addition South 36 degrees 43 minutes East 686.44 feet to an iron pin in the Northwestern right-of-wa line of the Southern RR Co. property; thence with said right-of-way North 27 degrees 40 minutes Eas 260 feet to a point, the place of BEGINNING, as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958. BOOK 1819 PAGE 689

This conveyance is made subject to right-of-way along the Southwest line of this tract of land.

and all the estate, right, title and interest of the party of the First part therein, with the heredit-aments and appurtenances thereto appertaining, hereby releasing all claim to Homestead and Dower therein To have and to hold the said premises to the said part y of the second part, heirs and assigns forever.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand and seal the day and year first above written.

Signed, sealed and delivered in presence of ______ (L. S.)

______ (L. S.)

______ (L. S.)

______ (L. S.)

Person or Agency Responsible
For Payment of Taxes:

Name DANIEL E. JOHNSON

Address Suite 1600
912 S. GAY ST.
KNOXVILLE, TENN. 37902

I hereby swear or affirm that the actual consideration or true value of this transfer, whichever is greater, is $ 60,000 Affiant Dan Johnson
Subscribed and sworn to before me this 31st day of MAY, 19__

Notary Public Edward L Summers

STATE OF TENNESSEE } SS.
KNOX COUNTY.

Personally appeared before me Edward L. Summers ~~E. MICHAEL ELLIS~~, a Notary Public in and for said County, the within named bargainors, DAVID A. WITHERSPOON, JR.

with whom I am personally acquainted, and who acknowledged that he executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office this 25TH day of MAY 1984

Edward L. Summers, Notary Public.

My commission expires 10-3-84

STATE OF TENNESSEE, } SS.
______ COUNTY.

Personally appeared before me ______, a Notary Public in and for said County, the within named bargainors, ______

with whom I am personally acquainted, and who acknowledged that he executed the within instrument for the purposes therein contained. And ______, wife of the said ______ having appeared before me privately and apart from her husband, the said ______ acknowledged the execution of the said Deed to have been done by her freely, voluntarily and understandingly, without compulsion or constraint from her said husband, and for the purposes therein expressed.

Witness my hand and official seal at office in ______ Tennessee, this ______ day of ______ A. D. ______

______, Notary Public.

BOOK 1819 PAGE 691

...uit Claim Deed

—TO—

REGISTER'S OFFICE. } SS.
...e of Tennessee
...nty of
...eceived for record the ____ day
____ A. D. Nineteen Hundred
at ____ o'clock ____ M.
...d in Note Book ____ Page ____ and
...rded in Book of Deeds
____ Page ____
...itness my hand.
____ Register.
Paid ____
...e Tax - - - - - - $ ____
...ty Tax - - - - - -
...k's Fee - - - - - -

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	1.01		MARYVILLE PK

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	6/29/85	1856	26		0 P O BOX 2704 KNOXVILLE, TN 37901

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
	-	-	-	638.3 X 260 X IRR	0.00 - A.C. Deeded
		-			3.70 - A.C. Calculate

This Instrument Prepared by: Edward L. Summers
910 Andrew Johnson Plaza
Knoxville, Tennessee 37902

C1 *600
CE *33188 030
CS
*4680

WARRANTY DEED

THIS INDENTURE, made this 29 day of JUNE, A.D., 1985, between William Emil Nichols and wife, Vernette S. Nichols, and Maude Flenniken Nichols, mother of William Emil Nichols, all of Naperville, Illinois, First Parties, and Daniel E. Johnson of Knox County, Tennessee, Second Party.

WITNESSETH: that said First Parties, for and in consideration of the sum of Ten and no/100 Dollars ($10.00) to us in hand paid by Second Parties, the receipt of which is hereby acknowledged,

STEVE HALL
AUG 1 1 43 PM '85

have granted, bargained, sold and conveyed, and do hereby grant, bargain, sell and convey unto the said Second Party the following:

An undivided four-fifths (4/5) interest in and to the following described property and premises to wit:

Situated, lying, and being in the ninth (formerly fourteenth) Civil District of Knox County, Tennessee, being a 3.7 acre tract, described as follows:

BEGINNING at a point in the Northwestern right-of-way line of the Southern Railroad Company property, distant South 27 deg. 40 min. West measured along said Railroad right-of-way line 763.3 feet from an iron pin marking the most Southern corner of Lot No. 11 of the Joseph Lewis 1st Addition to Vestal; thence North 35 deg. 09 min. West 638.30 feet to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad Company right-of-way in the following chord calls and distances, to-wit: South 36 deg. 05 min. West 38.38 feet, South 38 deg. 30 min. West 101.86 feet, South 40 deg. 24 min. West 119.76 feet to an iron pin marking the most Northern corner of Lot No. 6 of the Joseph Lewis 3rd Addition to Vestal; thence along the Northeastern line of said Addition South 36 deg. 43 min. East 686.44 feet to an iron pin in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said right-of-way line North 27 deg. 40 min. East 260 feet to a point, the place of BEGINNING, as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Being the same property in which William Emil Nichols acquired a one-fifth (1/5) undivided interest from Thomas W. Flenniken, Sr. by deed dated August 16, 1950, of record in Warranty Deed book 840, Page 77, in the Register's Office for Knox County, Tennessee.

Also being the same property in which William Emil Nichols acquired an undivided one-fifth (1/5) interest, and an undivided one-tenth (1/10) interest from Mabel Flenniken by deed dated September 8, 1978, of record in Warranty Deed book 1654, Page 701, in the Register's Office for Knox County, Tennessee.

Also being the same property in which Maude Flenniken Nichols acquired an undivided one-fifth (1/5) interest by inheritance from her mother, Margaret Flenniken Flenniken, and an undivided one-tenth (1/10) interest from Sara Drake Flenniken by deed dated March 10, 1966, of record in Warranty Deed Book 1317, at page 319, in the Register's Office for Knox County, Tennessee.

COUNTERSIGNED
AUG - 1 1985
MARK M. (Parker)
KNOX COUNTY
PROPERTY ASSESSOR

BOOK 1856 PAGE 026

with the hereditaments and appurtenances thereto appertaining, hereby releasing all claims to homestead and dower therein. TO HAVE AND TO HOLD THE said premises to the said Second Party, his heirs and assigns forever.

And said First Parties, for themselves and for their heirs, executors and administrators do hereby covenant with said Party, his heirs, and assigns, that they are lawfully seized in fee simple of the premises above conveyed and have full power, authority and right to convey the same, and that said premises are free from all incumbrances except all real estate taxes which Second Party shall assume and pay, and all easements, rights of way, and restrictions of record and that they will forever warrant and defend the said premises and the title thereto against the lawful claims of all persons whomsoever.

The designation of the parties to this instrument in either the plural or singular shall be applied to, and mean, either number and whenever a pronoun is used it shall be construed to represent either singular or plural as the case may demand.

IN WITNESS WHEREOF the said First Parties hereunder set their hands and seals the day and year first above written.

William Emil Nichols (L.S.) Maude Flenniken Nichols (L.S.)
William Emil Nichols — Maude Flenniken Nichols

Vernette S. Nichols (L.S.) ______________ (L.S.)
Vernette S. Nichols

STATE OF ILLINOIS)
COUNTY OF DuPage)

Personally appeared before me, the undersigned authority, a Notary Public in and for said County and State William Emil Nichols, Vernette S. Nichols and Maude Flenniken Nichols the within named bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office, in DuPage County, this 29th day of June, 1985.

Marion J. Haupt
Notary Public

My Commission Expires: My Commission Expires June 13, 1987

I certify that the consideration tax on the within Deed has been paid. Witness my hand this AUG 1 1985

STATE OF ILLINOIS)
COUNTY OF)

Personally appeared before me, the undersigned authority, a Notary Public in and for said County and State ______________

______________ the within named bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office, in __________ County, this _____ day of ______________ 1985 6.30 .50

Clerk Fee 10.80 ______________ Notary Public

Total

My Commission Expires: __________

I hereby swear or affirm that the actual consideration or true value of this transfer, whichever is greater, is $ [illegible].
Affiant [signature]
Subscribed and sworn to before me this 1 day of August, 1985.
BOOK 1856 PAGE 027 [signature]
Notary Public
My Commission Expires: October 20, 1987.

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 10-Nov-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	135	C	D	10		MARYVILLE PK

Owner	Deed Date	Book	Page	IRS	Mailing Address
RIMMER BROTHERS TRUCK PARTS INC	11/3/88	1962	31	$ 40,000	1624 OLD MARYVILLE PK KNOXVILLE, TN 37920

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
JOSEPH LEWIS 3RD ADDN	-	6-	14-214	605M X 964M X IRR	12.45 - A.C. Deeded
					0.00 - A.C. Calculate

THIS INSTRUMENT PREPARED BY:
Robert H. Leonard, Attorney
Suite 1219
First American Center
507 Gay Street SW
Knoxville, Tennessee 37902

RESPONSIBLE TAXPAYER & OWNER:
NAME Rimmer Bros Truck Parts, Inc.
ADDRESS 1624 Old Maryville Pike
Knoxville, Tn 3792
INSTRUMENT NO. 805994

WARRANTY DEED

THIS INDENTURE, made this 3rd day of November A. D., 19 88, between SHERRILL MITCHELL and wife, FANNIE N. MITCHELL,

of Knox County, Tennessee, First Parties, and

RIMMER BROTHERS TRUCK PARTS, INC., a Tennessee corporation, with its office and principal place of business in Knox County, Tennessee,
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX Second Parties,

WITNESSETH: that said First Parties, for and in consideration of the sum of One and No/100 Dollars ($ 1.00) cash and other good and valuable considerations to us in hand paid by Second Parties, the receipt of which is hereby acknowledged,

POST REGISTERED
NOV 0 7 1988
STRADER
COUNTY
ASSESSOR

01 * *800
08 * *13200
09 * *050
4050
4050
4050
*000
1107-88

have granted, bargained, sold and conveyed, and do hereby grant, bargain, sell and convey unto the said Second Parties the following described premises, to wit: Situated in District Nine of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, being known and designated as all of Lot 6, Joseph Lewis Third Addition, as shown upon map of same of record in Map Book 14, page 214, in the Office of the Register of Deeds for Knox County, Tennessee, to which map specific reference is hereby made for a more particular description, and

BEING a portion of the same property conveyed to Sherrill Mitchell and wife, Fannie N. Mitchell, by Lease Investments, Inc., a Tennessee corporation, by warranty deed recorded April 27, 1979, of record in Deed Book 1674, page 122, in the Office of the Register of Deeds for Knox County, Tennessee, to which specific reference is hereby made for further description.

This property is herein conveyed and accepted subject to the following restriction, to-wit: the northerly 50 feet of the above described property (except for a right-of-way approximately 20 feet in width lying immediately South of and adjacent to the Louisville & Nashville Railroad right-of-way, which 20 feet may be used as a right-of-way, but if not so used, shall be subject to this restrictions) is hereby restricted for a period of 50 years from and after the date of this deed against any use whatsoever, except as a buffer zone wherein trees, bushes and shrubs shall be allowed to grow to their maturity in such a way as to provide a visual screen between the property herein conveyed and the property of Knoxville Scenic Studios, Inc., its successors and assigns. By accepting this deed, Second Parties do for themselves, their heirs, successors and assigns, consent and agree to the imposition of this restriction and do further agree that said restriction may be enforced by Knoxville Scenic Studios, Inc., its successors and assigns, either in a court of law for damages for violation thereof or in a court of equity for specific performance. This restriction shall run with the title to the land and be enforceable for its 50-year term, whether or not specifically mentioned in any subsequent deed or deeds. This conveyance is further made SUBJECT to all applicable restrictions, easements and minimum building setback lines as are shown of record and to all existing easements, whether or not shown of record.

This description is prepared from information furnished to the preparer; and no representation as to the accuracy thereof is made, intended or to be implied. The preparer of this instrument makes no representation as to the status of the title of the property described and conveyed herein.

There is also quitclaimed hereby any and all of First Parties' easements and rights-of-way for ingress and egress to and from Maryville Pike as the same may be appurtenant to the property above described.

RECEIVED FOR RECORDING
NOV 7 9 01 AM '88
NOTE BOOK 113
STEVE HALL

with the hereditaments and appurtenances thereto appertaining, hereby releasing all claims to homestead and dower therein. TO HAVE AND TO HOLD THE said premises to the said Second Parties, their heirs and assigns forever.

And said First Parties, for themselves and for their heirs, executors and administrators do hereby covenant with said Parties, their heirs, and assigns, that they are lawfully seized in fee simple of the premises above conveyed and have full power, authority and right to convey the same, and that said premises are free from all incumbrances except the 1988 property taxes, which are to be prorated between the parties and which Second Parties hereby assume and agree to pay,

and that they will forever warrant and defend the said premises and the title thereto against the lawful claims of all persons whomsoever.

The designation of the parties to this instrument in either the plural or singular shall be applied to, and mean, either number and whenever a pronoun is used it shall be construed to represent either singular or plural, as the case may demand.

IN WITNESS WHEREOF the said First Parties hereunder set their hands and seals the day and year first above written.

Sherrill Mitchell (L. S.) Fannie N. Mitchell (L. S.)
Sherrill Mitchell Fannie N. Mitchell

(L. S.) (L. S.)

STATE OF TENNESSEE, }
KNOX COUNTY } ss.

Personally appeared before me, the undersigned authority, a Notary Public in and for said County and State, SHERRILL MITCHELL and wife, FANNIE N. MITCHELL,

the within named bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office, in Knox County, this 4th day of November, 1988.

My Commission expires October 19, 1992 Notary Public

R. H. LE... NOTARY PUBLIC KNOX CO.

State Tax 133.00
Clerk Fee .50
Total 133.50

I certify that the consideration tax on the within Deed has been paid. Witness my hand this NOV 7 1988

STATE OF }
COUNTY OF } ss.

Personally appeared before me, the undersigned authority, a Notary Public in and for said County and State

REGISTER OF DEEDS

the within named bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office, in .... County, this .... day of .... 19........

My Commission expires........ Notary Public

STATE OF TENNESSEE
COUNTY OF KNOX

BOOK 1962 PAGE 0032

I hereby swear or affirm that the actual consideration for this transfer or value of the property transferred, whichever is greater, is $ 40,000.00, which amount is equal to or greater than the amount which the property transferred would command at a fair, voluntary sale.

Atty for Purchaser

Sworn to and subscribed before me on this 7 day of Nov., 1988.

FORM 103

~~Notary Public~~ Dep. Register

~~My commission expires~~

LIST OF REFERENCES

SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061 TSDF #47-559

BELLSOUTH. 1997. Knoxville Area White and Yellow Pages. December.

Burress, J. 1994. (Plant Manager, Smokey Mountain Smelters). Letter to D. Henshaw (Knox County Air Pollution Control), RE: operations, May 3.

Duncan, J. 1983. (Congress of the United States). Letter to J. Lovett (Director of Knox County Department of Air Pollution Control), RE: Complaint, July 27.

IT. 1990. International Technology Corporation Analytical Services. "Analytical Results of Sample". September 24.

KCDAPC. 1980. Permit Application, Form APC-1. Received by the Knox County Department of Air Pollution Control, filed by Dan E. Johnson, President, Smokey Mountain Smelters, Inc. November 7.

KCDAPC. 1983. Facility Inspection Report, David Witherspoon, Inc. - Witherspoon and Johnson Dump. Inspected by the Knox County Department of Air Pollution Control, December 5.

KCDAPC. 1984. "Disposal of Slag from RF/SMS operations", memo to L.L., J.C., J.L. (KCAPC), from W. Schaad, dated February 8.

KCDAPC. 1989. "List of complaints, inspections, and Departmental action", Knox County Department of Air Pollution Control, August 10.

KCDAPC. 1985. "David Witherspoon - Historical Record", Knox County Department of Air Pollution Control.

Maupin, B.H. (TDEC/DSF). 1997a. Estimation of the groundwater pathway secondary target population. December 1997.

Maupin, B.H. (TDEC/DSF). 1997b. Hazardous waste quantity calculation. December.

Maupin, B. H. 1997c. (TDEC/DSF). Letters to Daniel E. Johnson (Property Owner), RE: Site Entry - Smokey Mountain Smelters. Tennessee Department of Environment and Conservation/Division of Solid Waste Management. September 9.

Maupin, B.H. (TDEC/DSF). 1997d. "Features within a four miles radius of Smokey Mountain Smelters". December.

Maupin,,B.H. (TDEC/DSF). 1997e. "Home and unspecified-use wells within a four miles radius of Smokey Mountain Smelters". December.

Maupin, B.H. (TDEC/DSF). 1997f. Potential Hazardous Waste Site - Site Identification ("Discovery") August 6.

Maupin, B.H. 1997g. "WHPA near SMS", memo to Files (DSF), dated November 21.

TDC/Division of Geology (DG). 1956. "Ground-Water Resources of East Tennessee". State of Tennessee, Department of Conservation, Division of Geology. Bulletin 58, Part 1, pp. 6-9, 12, 43-4, 245-68, Plate 9 (See Figure 5, "GEOLOGIC MAP").

TDEC/Division of Natural Heritage (DNH). 1997. "Project review information for endangered species and critical or sensitive habitat," memorandum to F. Grubbs (TDEC/DSF/NCO) from A. Barass (TDEC/DNH), dated October 8. Smokey Mountain Smelters Project, along Flenniken Branch to Tennessee River, near Knoxville, Knox County, TN.

TDEC/Division of Water Pollution Control (DWPC). 1995. State of Tennessee Water Quality Standards, Chapter 1200-4-4, Use Classifications for Surface Waters. July. pp: 354-6.

TDEC/Division of Water Supply(DWS). 1997a. Records of Water Wells on the Knoxville Quadrangle (0147NW) TN. November 12. Pp.:13-23.

TDEC/DWPC. 1996. Tennessee Fishing Advisories. Tennessee Department of Environment and Conservation. March 1992, revised May 1996.

TDEC/DWS. 1997b. Records of Water Wells on the Maryville Quadrangle (0147SW) TN. November 12. Pp.:35-43.

TDEC/DWS. 1997c. Records of Water Wells on the Shooks Gap Quadrangle (0147NE) TN. November 12. Pp.:1-12.

TDH/Division of Laboratory Services (DLS). 1997. "Laboratory Reports". Tennessee Department of Health/Division of Laboratory Services. October-November.

TDHE/Division of Solid Waste Management (DSWM). 1990. Tennessee Department of Health and Environment, Special Solid Waste Notice of Approval (Letter #2468/2640), issued to Smokey Mountain Smelters, Inc. October 12.

TVA. 1993. "Tennessee Valley Reservoir and Stream Quality - 1993". Tennessee Valley Authority, Division of Water Management, May 1994.

U. S. EPA. 1990. Graphical Exposure Modeling System (GEMS) Database. U.S. Environmental Protection Agency. Compiled from U.S. Bureau of the Census Data (1990).

U.S.D.A./S.C.S. 1955. Soil Survey / Knox County Tennessee, (with map). U.S. Department of Agriculture/Soil Conservation Service. August. pages: 4-9, 12-27, 102-5, 116-19, 136-7, 198-203, 220-23, 226-7, 230-1, 234-5, 238-9, and Soil Map - Knoxville Quadrangle (Figure 6 - Soil Map).

USBC 1990. United States Bureau of the Census. 1990 US Census Data.

USDC. 1993. Rainfall Frequency Atlas of the United States. U.S. Department of Commerce, Hydrologic Services Division. July. Chart 44, page: 95.

USDC/NOAA. 1968. Climatic Atlas of the United States. U. S. Department of Commerce, National Oceanic and Atmospheric Administration. June. page: 78.

Wark K. And Warner C. 1981. Air Pollution - Its Origin and Control, Second Edition. New York: Harper & Row. Pp: 97 and 477.

White, J. 1995. Directory of Tennessee Manufacturers. M. Lee Smith Publishers and Printers LLC.

" Knoxville Area White and Yellow Pages "

BELLSOUTH. 1997. Knoxville Area White and Yellow Pages. December.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

BELLSOUTH

Knoxville Area

White and Yellow Pages

including Concord, Halls Cross Roads, Mascot-Strawberry Plains, Maynardville, Powell-Claxton.

December 1996

© 1996 BAPCO

Keep Until December 1997

Mobilescreen ——— 573-0796
Mobile Service Inc 1919 N Broadway 37917 ——— 546-7181
MODEL CONSTRUCTION & SUPPLY CO
3045 Sutherland Av 37919 ——— 524-1106
Model Roofing & Supply Co
3045 Sutherland Av 37919 ——— 524-1106
Model Search ——— 453-1489
Models Inc ——— 691-4165
Models Day Metals 2218 Lowell Rd 37932 ——— 691-5235
MODERN DUPLICATING PRODUCTS INC
10413 Dutch Town Rd Knoxville ——— 671-4660
MODERN SUPPLY
MODERN SUPPLY CO
525 LOVELL RD ——— 966-4567
3915 University Av 37921 ——— 546-7941
Modern Technology Corporation
1626 Downtown West Blvd 37919 ——— 691-7859
Modern Video 8527 Asheville Hwy Mascot ——— 933-4890
Modern Woodmen Of America Life Insurance Society
Agency Ofc 151 Sherway Rd 37922 ——— 693-3377
Agency Ofc 151 Sherway Rd 37922 ——— 693-7277
District Ofc 151 Sherway Rd 37922 ——— 690-7107
MODINE MANUFACTURING CO—
Plant 4000 Yarnell Industrial Pkwy Clinton Tn ——— 457-3100
5050 S National Dr 37914 ——— 546-5920
Modulll Inc 201 Sherlake Ln 37922 ——— 691-3878
Modulaire A WMI Service
2552 Western Av 37921 ——— 525-0529
Moffett Steven R MD
St Mary's Professional Bldg ——— 525-1088
Mohr Patricia A MD 1930 Alcoa Hwy 37920 ——— 544-6655
Mollenhour Michael J atty
106 Mayflower Dr 37920 ——— 609-1040
Molloy B Shawn OD
Northgate Plaza Shopping Center ——— 688-9241
MOLLOY MICHAEL J DDS ofc
808 Winona 37917 ——— 524-4665
Molly Maid Of West Knoxville
5612 Kingston Pke 37919 ——— 558-1200
Molnar Terry PhD
119 W Summit Hill Dr 37902 ——— 525-1099
Molnar Terry PhD 201 W Weisgarber Rd ——— 584-8501
Molsbee Richard
10080 Double Tree Rd Knoxville 37932 ——— 966-4306
Mommy And Me 5309 Clinton Hwy 37912 ——— 219-0024
Monaghan John rest
1645 Downtown West Blvd 37919 ——— 531-2121
Monarch Publishing Co
4601 Simona Rd 37918 ——— 689-8944
Mona's Nesting Place
7808 Clapps Chapel Rd ——— 688-9305
Monceret A Thomas And Associates atty 800 S Gay St 37929 ——— 546-0405
Moncier Herbert S atty
Suite 775
550 Main Av 37902 ——— 546-7746
Res 460 Boxwood Sq 37919 ——— 522-0241
Children's Line ——— 523-1337
Cobbly Nob ——— 436-3821
Monday Development Co
625 N Central 37917 ——— 525-5191
Monday Gene Realty Co
625 N Central 37917 ——— 525-5191
MONDAY MOTOR PONTIAC BUICK & GMC
1311 W Central Av Lafollette Tn 37766
KNOXVILLE TEL NO ——— 523-5728
Monday Realty Co 625 N Central 37917 ——— 525-5191
MONEY TREE 4807 N Broadway 37918 ——— 689-2800
Monitor Shop The 6707 Kingston Pke 37919 ——— 588-2667
MonkeyShines ——— 988-3301
Monks Mortgage Corp Of Tn
7815 Kingston Pke 37919 ——— 690-0300

Monkus Jerry CLU ChFC
7090 Kingston Pke 37919 ——— 588-1811
Monnig Roch ——— 588-7771
Monogram Shop The
4630-F Old Kingston Pke 37919 ——— 584-8461
Monograms Inc 130 N Peters Rd 37923 ——— 690-1043
Monograms Plus ——— 579-9500
Monroe County Mobile Homes
3960 Highway 411 Madisonville 37354 ——— Knoxville Tel No ——— 637-9234
Monroe Jean ——— See Munroe Jean
Monroe Logistics 4629 Rutledge Pke 37914 ——— 525-4744
Monroe Marshall Land Surveyor ——— 922-4728
Monroe Marshall Land Surveyor
3625 Rothmoor Dr 37918 ——— 689-9995
Monroe Maternity Center Inc
Highway 68 Madisonville Tn ——— Knoxville Tel No ——— 525-8366
Monroe Plumbing ——— 522-2201
Monroe Systems For Business
900 E Hill Av 37915 ——— 637-2214
Monroe Thomas P 3502 Vera Dr 37917 ——— 546-8217
Monroe's Interiors
8106 Asheville Hwy Knoxville 37924 ——— 933-5866
Monroe's Wallpaper For Less
8106 Asheville Hwy Knoxville 37924 ——— 933-5866
Monsarrat Artisan Gallery
5400 Homberg Dr 37919 ——— 588-0274
Monster Tee's
220 W Dumplin Valley Rd Kodak 37764 ——— 932-1058
Monterey Mushrooms Inc
19748 Highway 72 N
Loudon Tn 37774 ——— Knoxville Tel No ——— 546-4837
Monterrey Mexican Restaurant
105 Cedar Ln 37912 ——— 688-5668
MONTESSORI ACADEMY OF KNOXVILLE
Ages 3 Thru Kindergarten
8042 Gleason Dr 37919 ——— 691-5753
MONTESSORI INTERNATIONALE SCHOOL
10019 Northshore Dr Knoxville ——— 675-0545
Montessori-Knoxville
4311 Kingston Pke 37919 ——— 525-6042
Montessori School Alcoa Hwy ——— 970-4322
MONTESSORI SCHOOL FARRAGUT
11212 Kingston Pk Farragut ——— 671-4334
MONTESSORI SCHOOL NATURE'S WAY
4710 Murphy Rd 37918 ——— 689-8976
Montgomery Anna H ofc
1439 W Depot Av 37917 ——— 673-6251
Montgomery And Co rest
727 Cheowa Cr 37919 ——— 523-1111
Montgomery David OD
1124 Weisgarber Rd 37909 ——— 584-2282
Montgomery David N OD
5300 Millertown Pke 37924 ——— 637-1046
Montgomery Elevator Company ——— See Montgomery KONE
Montgomery Jack L ofc
727 Cheowa Cr 37919 ——— 523-1111
Res 727 Cheowa Cr 37919 ——— 524-7047
Montgomery James H III PhD
10263 Kingston Pke 37922 ——— 690-9998
MONTGOMERY JOHN INSURANCE AGENCY
810 State 37902 ——— 523-7141
Montgomery John L Jr MD—
UT Medical Center ——— 524-9871
Fort Sanders West ——— 539-6052
Montgomery John W 810 State 37902 ——— 523-7141
Res 3201 Ellis 37920 ——— 577-1866
Montgomery KONE 316 Nancy Lynn Ln 37919 ——— 584-3377
Montgomery Robert N MD ofc—
For Appointment Call
9333 Park West Blvd 37923 ——— 531-4610
Res 12100 Leatherwood Ln Concord Tn ——— 966-7089
Montgomery Village Baptist Center
4601 Joe Lewis Rd 37920 ——— 577-6244
Montgomery Village Ministry
1124 Cook Dr 37920 ——— 577-5555
Monticello Life Insurance Co
9050 Executive Park Dr 37923 ——— 693-3437
Montie Diane B atty 3213 Montlake Dr 37920 ——— 577-1333
Montpelier Dale J atty 531 S Gay St 37902 ——— 673-0330
Montpelier & Young PLC
531 S Gay St 37902 ——— 673-0330
Monumental Restorations Inc
4411 Plummer Dr 37918 ——— 281-9822
Monya Studio 1016 Laurel Av 37916 ——— 637-3979
Moody Todd J atty 900 S Gay St 37902 ——— 525-7313
MOON CAPITAL MANAGEMENT
900 S Gay St 37902 ——— 546-1234
Moon David ofc 900 S Gay St 37902 ——— 546-1234
Moon Sien ofc 9000 Executive Park Dr 37923 ——— 694-2113
Mooney Doug 10325 Technology Dr Concord ——— 675-6500
Moonlight Jewelry
9325 Collingwood Rd 37922 ——— 694-7970
Moon's Used Parts 9922 Hall Dr ——— 693-7106

Moon's Wrecker Service
2607 Sutherland Av 37919 ——— 522-0583
2607 Sutherland Av 37919 ——— 522-0597
Moore Bill Silver Matching Service
810 Mohican 37919 ——— 584-7642
MOORE BROOKS & RAGLE atty
602 S Gay St 37902 ——— 637-2523
Moore Business Forms & Systems Division 5500 Lonas Dr 37909 ——— 558-8045
Moore & Clark Attorneys
2415 E Magnolia Av 37917 ——— 546-7074
Moore Dale 7524 Kingston Pke 37919 ——— 584-4658
Moore Daniel J atty 900 S Gay St 37902 ——— 215-1000
Moore David F & Associates Inc
8705 Unicorn Dr 37923 ——— 693-0388
Moore David L MD PC 1801 Alcoa Hwy 37921 ——— 521-8001
MOORE DAVID L MD PC
1601 Western Av 37921 ——— 546-5177
Moore Denise 6547 Chapman Hwy 37920 ——— 609-9793
Moore Eddie S MD 1930 Alcoa Hwy 37920 ——— 544-6655
Moore Gloria S 2415 E Magnolia Av 37917 ——— 546-7074
Moore Heating & Air Conditioning
1108 Tarwater Rd 37920 ——— 573-8333
Moore James M atty 706 Walnut 37902 ——— 524-2165
Moore James R atty 602 S Gay St 37902 ——— 637-2523
Moore John 2335 Piney Grove Church Rd 37909 ——— 693-1916
Moore John Business Supplies
1540 Amherst Rd 37909 ——— 588-0992
Moore John R
4712 E Governor John Sevier Hwy 37914 ——— 522-4743
Moore L A Salon 711 N Cherry St 37914 ——— 637-2133
Moore And Moore Development Corp 1601 Western Av 37921 ——— 633-5110
Moore Mortgage And Investment Company ——— 690-2010
Moore Pete Appliances
3415 N Broadway 37917 ——— 687-7551
Moore Phillip Outreach Center
224 Pickering St 37914 ——— 546-3759
Moore Products Co
6415 Deane Hill Dr 37919 ——— 584-6131
Moore R M Real Estate Company
9700 Kingston Pke 37922 ——— 531-6400
Moore Richard E DDS PC
121 David Ln 37922 ——— 693-2680
MOORE ROBERT S JR MD
11657 Chapman Hwy ——— 577-4836
Moore Scott CPA
301 S Gallaher View Rd 37919 ——— 694-0391
Moore Shelba ofc 7641 Pennyroyal Dr 37920 ——— 573-3211
MOORE & SMITH ATTORNEYS
706 Walnut 37902 ——— 524-2165
Moore Tim S atty—
396 Moore Brand Way
Newport Tn 37821 ——— Knoxville Tel No ——— 525-3871
Mooreland Heights Baptist Church
5214 Magazine Rd 37920 ——— 577-9123
Mooreland Heights Elementary School—
Office 5315 Magazine Rd 37920 ——— 579-2105
Cafeteria 5315 Magazine Rd 37920 ——— 579-2107
Moores Equipment Co
6915 Old Rutledge Pke 37924 ——— 524-3246
Moore's Garage 1720 Cecil Av 37917 ——— 523-1241
Moore's Hardware Store
6226 Clinton Hwy 37912 ——— 687-8441
Moore's Lumber And Building Supplies—
6226 Clinton Hwy 37912 ——— 687-8441
Contractor Sales ——— 687-8465
Contractor Fax ——— 687-5473
Moore's Potato Chip Co
957 Hillside Dr Louisville ——— 970-2314
Moores Ray N 6915 Old Rutledge Pke 37924 ——— 524-3246
Res 8524 Dresden Dr 37923 ——— 693-4309
More Than Plants
2525 W Highway 11-E Strawberry Plains 37871 ——— 932-2482
Morehead Lance MD
Suite 100
9303 Park West Blvd 37923 ——— 690-6451
Moreland Inc 406 Union Av 37902 ——— 673-8916
Moreland Jim PA
325 Wears Valley Rd Pigeon Forge 37863 ——— 453-9045
Morell James V 2716 Sutherland Av 37919 ——— 523-0411
MORENO FRANCISCO G MD FACS Fort Sanders Prof Bldg ——— 546-2888
Moretz M Denise atty 900 S Gay St 37902 ——— 215-1000
MORETZ MOVING
8117 Bell Campground Rd Powell ——— 938-5810
Morgan Auto Sales
8106 Chapman Hwy 37920 ——— 579-0149
Morgan Bruce 1900 N Winston Rd 37919 ——— 691-4847
Residence Phone ——— 694-4422
Morgan Carl E ofc 439 W Depot Av 37917 ——— 673-9020
Morgan Construction Co Inc
6221 Riverview Crossing Dr ——— 523-1059
Morgan H Forest Rev
1723 Washington Av 37917 ——— 522-7436

Morgan Hugh W atty 120
2500 First Tennessee Plaza
Gay 37929 ——— 525-
Morgan Kandyce K atty
1111 Northshore Dr NW 37919 ——— 584-
Morgan Katherine K
1701 Winston Rd 37919 ——— 539-
Morgan Keegan & Co Inc
550 Main St 37902 ——— 521-
Morgan Motel 927 Carrinos Way ——— 970-
Morgan Tom MD Ft Sanders Trustees Tower ——— 524-
Morgan Travis E MD (Retired)
930 E Emerald Av 37917 ——— 523-
Morgan Wesley G Jr PhD
601 S Concord 37919 ——— 523-
Res 7101 37919 ——— 558-
Morgan William R DDS
8912 Town & Country Cr 37923 ——— 531-
Morgan's Ed Grocery
9501 Rutledge Pke Mascot 37806 ——— 933-
Morgans Watch ——— 933-
Mori Loggage & Gifts West Town Mall ——— 531-
Morie Angelia D atty 250 High St Maryville ——— 637-
MORNING STAR CHILD DEVELOPMENT CENTER INC 10614 Flickenger Lane ——— 671-02
Morning Star Missionary Baptist Church 3522 Island Home Pke 37920 ——— 577-
MORNINGSIDE GARDEN APARTMENTS
1800 Linden Av 37917 ——— 523-4
Morningside Homeowners Association 1600 Rosedale Av 37915 ——— 637-
Morningstar Maternity Services
2625 St James Av 37920 ——— 573-
Morrell Steve B & Lori
3100 Indigo Ln 37921 ——— 523-
Morris Coupling Co Inc
5320 S National Dr 37914 ——— 546-
MORRIS CREATIVE GROUP LLC 401 Henley St 37902 ——— 637-98
Morris Drug Center
2419 Washington Pke 37917 ——— 524-
Morris Gary MD 11230 Kingston Pke Farragut ——— 675-
Morris Kimberly L MD ofc
1928 Alcoa Hwy 37920 ——— 544-
Morris Motel 6262 Clinton Hwy 37912 ——— 687-
Morris Steven A MD ofc—
Baptist Medical Tower ——— 546-
9330 Park West Blvd 37923 ——— 690-
Fort Sanders Professional Bldg ——— 541-
If No Answer Dial ——— 673-
Morris Vacuum Products-Tennessee Tubebending Subsidiary
5320 S National Dr 37914 ——— 546-
Morrison Eric J 1st American Center ——— 546-
Morrison Max M atty 713 Market 37902 ——— 546-
Morrison Printing Co
1135 W Morris Blvd Morristown Tn ——— Knoxville Tel No ——— 546-
Morrison Robert DC
5612 Kingston Pke 37919 ——— 584-
Morrison Tyree & Dunn attys
713 Market 37902 ——— 546-
Morrison's Cafeteria—
3052 East Towne Mall 37924 ——— 522-
Foothills Mall Maryville Tn ——— 982-
Morristown Automatic Sprinkler Co Inc 1310 Karnes Av 37917 ——— 689-
Morristown Dialysis Center
826 W 4th N St Morristown Tn 37814 ——— 587-
MORRISTOWN FORD
1112 W Morris Blvd Morristown Tn 37813
KNOXVILLE TEL NO ——— 522-42
Morristown Monument Co
1220 N Cumberland St Morristown Tenn 37814 ——— Knoxville Tel No ——— 524-
MORRISTOWN STUCCO
6721 Asheville Hwy 37924 ——— 522-71
Morrow Appraisal Service
10805 Kingston Pke Knoxville ——— 675-
Morrow & Company
1204 Kenesaw Av 37919 ——— 525-
Morrow Della Mann CPA PFS
9724 Kingston Pke 37922 ——— 531-
Morrow Kenneth E atty
9111 Cross Park Dr 37923 ——— 691-
Res 1534 Hightop Tr 37923 ——— 693-
Morrow's Nut House East Towne Mall ——— 525-
Mortgage Broker Of East Tennessee 2861 Woodbine Av 37914 ——— 524-

68527 © BellSouth Advertising & Publishing Corporation 1997

Child Care Centers-(Cont'd)

(A List Arranged By Localities Follows This Classification)

O LEARN INC
• ONE BLOCK BEHIND WEST TOWN MALL
Intersection Of Gleason And Montvue
ARING FOR INFANTS - SCHOOL AGE
IN A BEAUTIFUL PARK-LIKE SETTING
EGREED LEAD TEACHERS
• 7:00 AM - 6:00 PM
• PROVIDING BREAKFAST, HOT LUNCH & SNACKS
FTER SCHOOL PICKUP
UMMER CAMP
EARLY CHILDHOOD CENTER
LTL AFTER SCHOOL FACILITY
693-5750 694-9228
4 Kendall Rd ---- 693-5750
After School Facility ---- 694-9228

ns Creek Mothers' Day Out
Strawberry Plains Pke
Strawberry Plains ---- 932-2319
Baptist Church
Chapman Hwy ---- 577-8969
Little Merrigolds
916 Edgewood Av ---- 524-9999

IDLEBROOK PLAY SCHOOL
Ages 6 Weeks & Up
Elementary After School Care
Transportation For Area Schools
Learning Center Environment
Hot Breakfast - Snack & Lunch
Summer Camp
Swimming Instruction In Our Pool
6:30 AM To 6 PM Weekdays
1 Robinson Rd ---- 690-1383

s Lori's Day Care
726 Pleasant Ridge Rd ---- 546-0969
's Nesting Place
Clapps Chapel Rd ---- 688-9305
N SSORI ACADEMY OF N VILLE
ee Our Ad At Schools-Academic-Pre-School Kindergartens
342 Gleason Dr ---- 691-5753
N SSORI INTERNATIONAL
C OL
Northshore Dr Knoxville ---- 675-0545
NTESSORI SCHOOL FARRAGUT
1212 Kingston Pk ---- 671-4334
ori School Nature's Way
Murphy Rd ---- 689-8976
R IG STAR CHILD
DEVELOPMENT CENTER INC
0614 Flickenger Lane ---- 671-0244
(Please See Our Display Ad Page 241)
VE CHILD DEVELOPMENT
ER
Maryville Pke ---- 577-7212
SCHOOL
157 Kingston Pke ---- 546-5074
Sisters's House 1415 Ebenezer Rd ---- 693-1240
S LITTLE TOTS
Albany Rd ---- 531-3341
S NURSERY INC
NAEYC Accredited
Infants through pre-kindergarten
Monday through Friday, 6:30 a.m. - 6:30 p.m.
Fort Sanders West Blvd ---- 690-7212
enant Child Learning Center
Hall Camp Pke ---- 588-5032
AH'S ARK CHRISTIAN CHILD CARE
N Cedar Bluff Rd ---- 694-4444
k Daycare 1804 Allen Av ---- 573-8400
Rainbo 2525 Merchants Dr ---- 523-6570
AY BAPTIST CHILDHOOD CENTER
"A Place Of Protection For Your Little Ones"
MOTHERS DAY OUT
GES: TODDLERS - 5 YEARS OLD
½ Mile South Of Kingston Pike
On S Peters Road
401 S Peters Rd ---- 470-2013
For Children Child Development
1124 N Broadway ---- 546-0301
For Children School Age Child
1323 N Broadway ---- 637-8508
Y ROOM THE
Kingston Pke ---- 675-5667

PRESCHOOL COOPERATIVE OF KNOXVILLE
3219 Kingston Pke ---- 637-3134
(Please See Our Display Ad Page 243)
Pride & Joy Children's Academy Inc
4418 Kingston Pke ---- 524-7907
(Please See Our Display Ad Page 242)

PRINCE & PRINCESS PLAYSCHOOL
Infants - 14 Years
Planned Curriculum
Hot Meals, Breakfast, Lunch, Snacks
After School Program
Transport To & From School Available
CPR & RED CROSS CERTIFIED
State Licensed
Mon Thru Fri 6am-6pm
180 Highway 70 W Lenoir City ---- 986-4865

Promises Child Enrichment Center Inc
3508 Maryville Pke ---- 573-5354
Quessy's Kids II 3429 Wilson Av ---- 637-4588
Quessy's Kids 1 600 S Chestnut St ---- 544-7264
RIDGEVIEW BAPTIST LEARNING CENTER
6125 Lacy Rd ---- 688-4137
Ridgeview Baptist Learning Center
6125 Lacy Rd ---- 688-8463
Riverside Day Care Center
2105 Riverside Dr ---- 637-2918
Romper Room Day Care
2546 Washington Av ---- 522-5350
Royale Child Care & Learning Center
1433 Ebenezer Rd ---- 690-3812
St Mark Early Enrichment Program
7001 Northshore Dr ---- 558-0585
SCHOOL OF CREATIVE LEARNING INC
Special Pre-School Experiences
7804 Northshore Dr ---- 691-3883
Sevier Heights Baptist Church
3706 Sevier Heights Rd ---- 577-1261
SUPER SITTERS
10517 Kingston Pke ---- 694-3280
(Please See Our Display Ad Page 241)

TAMMY'S QUALITY CHILD CARE
Ages 6 Wks to 10 Yrs
Educational Program
Open M - F 6:30 AM - 5:30 PM
2840 Teeple St ---- 522-0726

TATE'S AFTER SCHOOL
PICK UP K-5 FROM AREA PUBLIC SCHOOLS
"Providing The Highest In Quality Care"
200 Lockett Rd ---- 584-8791
7725 Oak Ridge Hwy ---- 691-2410
1501 Ebenezer Rd ---- 691-3811

Tate's After School
1501 Ebenezer Rd ---- 691-3811
Tate's School Of Discovery
1031 N Cedar Bluff Rd ---- 693-3021
TEDDY BEAR DAY CARE
522 Woodlawn Pke ---- 609-2122
Tender Moments Child Care Cen Ter
10058 Rutledge Pke Corryton ---- 932-4433

THACKSTON SCHOOL
ESTABLISHED IN 1920
PRESCHOOL THRU 6TH GRADE
ADJACENT TO UNIVERSITY OF TN.
2023 Lake Av ---- 522-0729

THACKSTON SCHOOL BRANCH INC
901 S 22nd St ---- 522-6053
(Please See Our Display Ad Page 242)
Toddler Tech 4404 Holston Dr ---- 522-5735
Trinity Child Development Center
5613 Oak Ridge Hwy ---- 588-6833
Trinity School Age 5613 Western Av ---- 588-7671

UNIVERSITY OF TENNESSEE
UT CHILD DEVELOPMENT LABORATORIES
Accredited by NAEYC for 10+ years!
Full-Time Care 6 Wks to 5 Years
Creative Play Curriculum
Homecooked lunches & snacks
Computers for Preschoolers
7:30 a.m. to 5:30 p.m. M-F
1206 White Ave ---- 974-0843

WALLACE MEMORIAL BAPTIST CHURCH
BEFORE & AFTER SCHOOL CARE
701 Merchants Rd ---- 688-7270
PRE SCHOOL CHILD CARE
701 Merchants Rd ---- 689-3940
(Please See Our Display Ad Page 242)

WASHINGTON ACADEMY
PRE SCHOOL THROUGH 12TH GRADE
3550 Pleasant Ridge Rd ---- 522-5926

WATCH ME GROW CDC
Please See Our Display Ad At This Heading
1637 Downtown West Blvd ---- 670-0054
West End Kindergarten & Day Care
8301 E Walker Springs Ln ---- 690-0900

West Lonsdale Baptist Church
2720 Dayton ---- 544-1829

WESTSIDE LEARNING CENTER
"Your Child's Home Away From Home"
LOW CHILD TO TEACHER RATIO
GREAT CONVENIENT LOCATION!!
(WEST TOWN MALL AREA)
STATE LICENSED - CAC ACCEPTED
CRAWLERS TO 5 YEARS OLD
7AM - 6PM MONDAY THRU FRIDAY
7737 Nubbin Ridge Rd ---- 691-0367

YMCA
Branches
Downtown YMCA 605 W Clinch Av ---- 522-9622
Child Care Programs
Pryme Time After School
605 W Clinch Av ---- 546-0600
YMCA Learning Center Child
Development Ctr 521 Sevier Av ---- 577-0138
City Kids Child Development Center
605 W Clinch Av ---- 521-7165
(Please See Our Display Ad Page 241)

LOCALITY GUIDE

Child Care Centers-A List Arranged By Localities

BEARDEN AREA

A 2 Z Learning Tree 321 Erin Dr ---- 588-3387
Christian's Preschool & Childcare
6410 Deane Hill Dr ---- 588-2874
Cradles & Crayons Child Care Center
304 Weisgarber Rd ---- 588-7073
Pride & Joy Children's Academy Inc
4418 Kingston Pke ---- 524-7907

CONCORD

CHILDREN'S CHOICE LEARNING CENTER
10555 Kingston Pke ---- 691-2244

DOWNTOWN

Childrens Center Of Knoxville Inc
301 Frank St ---- 523-2672
THACKSTON SCHOOL BRANCH INC
901 S 22nd St ---- 522-6053

EAST KNOXVILLE AREA

A B C KIDDIE ACADEMY
3100 Linden Av ---- 522-1096
Fifth Avenue Baptist Church
2500 E 5th Av ---- 523-9652
Kids Stop 4722 Plymouth Dr ---- 522-2131
KNOXVILLE BAPTIST CHRISTIAN SCHOOL
2434 E 5th Av ---- 524-3211
KREATIVE KIDS LLC
2515 E 5th Av ---- 524-3133
Little White House The
6605 Ruggles Ferry Pke ---- 522-2321

FARRAGUT-CONCORD AREA

CHILDREN'S NEIGHBORHOOD
11227 West Point Dr Farragut ---- 675-2273
CLUBHOUSE CHILDCARE
11000 Kingston Pke ---- 966-2582
FARRAGUT MONTESSORI SCHOOL
11212 Kingston Pk ---- 671-4334
Kid Company The 120 DeBusk Ln ---- 690-4084
Morning Star Child Development Center Inc 10614 Flickenger Lane ---- 671-0244

Thousands of people use The Real Yellow Pages® as a Buyer's Guide. Every department of your business should be completely represented here.

LOCALITY GUIDE

Child Care Centers-A List Arranged By Localities

HALLS CROSS ROADS AREA

CUBBY BEAR PRE-SCHOOL & CHILD CARE CENTER
Pre-School Enrichment Program
Hot Lunches & 2 Snacks
Before & After School Programs
Summer Programs Available
Open Mon - Fri 6:00 AM - 6:00 PM
AGES 2-12 YEARS • STATE LICENSED
6830 Tice Lane Halls Cross Roads ---- 922-4284

WORLD OF WONDER CHILDREN'S LEARNING CENTER
Halls Plaza Shopping Center ---- 922-6284

MAGNOLIA AVE AREA

A B C Kiddie Academy 3100 Linden Av ---- 522-1096
DONNA'S DAY CARE CENTER INC
24 HOUR CARE
STATE LICENSED
OVER 30 YEARS EXPERIENCE
3505 Skyline Dr ---- 673-0850

NORTH KNOXVILLE AREA

First Step Day Care/First Step I
3717 Powers St ---- 688-1086
KIDS FIRST LEARNING CENTER
6700 Central Avenue Pke ---- 688-9736
Lonsdale Day Care Center
1212 New York Av ---- 524-0881
Ridgeview Baptist Learning Center
6125 Lacy Rd ---- 688-4137
Tammy's Quality Child Care
2840 Teeple St ---- 522-0726
WALLACE MEMORIAL BAPTIST CHURCH
PLEASE SEE OUR DISPLAY AD AT CHILD CARE CENTERS
701 Merchants Rd ---- 689-3940

OAK RIDGE HWY AREA

Karns Child Care Center
7717 Oak Ridge Hwy ---- 690-4954
Tate's After School
7725 Oak Ridge Hwy ---- 691-2410

SOUTH KNOXVILLE AREA

Beginning Impressions Academic Child Care Center 303 Kyker Ferry Rd Kodak ---- 932-0130
Graystone Day Care Center
139 Woodlawn Pke ---- 577-0287
KID'S STUFF CHILD CARE
School Age K - 6th Graders
After School Pick-Up, Holidays & Summer
State Licensed • CAC Accepted
801 Sevier Ave ---- 579-8259
Little Johnnie Dollar Child Care & Learning Center 1600 Willoughby Rd ---- 577-0123
Mt Olive Child Development Center
2500 Maryville Pke ---- 577-7212
Promises Child Enrichment Center Inc
3508 Maryville Pke ---- 573-5354

U T AREA

Church Street United Methodist Church ---- 524-3511
First United Methodist Church Child Development Center 3316 Kingston Pke ---- 525-8843
Little Johnnie Dollar Child Care & Learning Center 1600 Willoughby Rd ---- 577-0123
Preschool Cooperative Of Knoxville
3219 Kingston Pke ---- 637-3134
Thackston School 2023 Lake Av ---- 522-0729
THACKSTON SCHOOL BRANCH INC
901 S 22nd St ---- 522-6053
(Classification Continued Next Page)

Be efficient! Save gas! Save energy! Save time! Find that item faster and easier in The Real Yellow Pages®.

©2002 BellSouth Advertising & Publishing Corporation

" Burress (Plant Manager, Smokey Mountain Smelters) Letter to Knox County Air Pollution Control "

Burress, J. 1994. (Plant Manager, Smokey Mountain Smelters). Letter to D. Henshaw (Knox County Air Pollution Control), RE: operations, May 3.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

MAY 3, 1994

DAVID HENSHAW
KNOX COUNTY AIR POLLUTION CONTROL
400 MAIN STREET
ROOM 339
CITY-COUNTY BUILDING
KNOXVILLE, TN 37902-2405

DEAR MR. HENSHAW,

I HAVE APPOINTED ALLEN WRIGHT TO BE MODERATOR OF OUR ACTIVITY AT SMOKEY MOUNTAIN SMELTERS EVERYNIGHT FROM 8:00 P.M. TO 2:00 A.M. FOR THE NEXT 2 WEEKS.

ALLEN IS INSTRUCTED TO KEEP A LOG ON THE TIME, DATE AND ANY EVENT THAT MAY ARISE. ALLEN WILL DRIVE OVER TO DAYLILY DRIVE AT LEAST TWICE EACH NIGHT. ALLEN IS INSTRUCTED TO CALL ME AT ANY TIME THERE IS A PROBLEM.

I HAVE CONTACTED HOWARD CONSTRUCTION ABOUT LEVELING THIS AREA AND COVERING WITH RED CLAY. MR. RAY HOWARD SAID THAT HE COULD BE HERE WEDNESDAY MAY 5, 1994 IF IT DOES NOT RAIN TO HARD.

WE HAVE 2000 LBS. OF LIME COMING TO COVER WHERE WE ARE REMOVING SLAG, THE LIME WILL BE APPLIED AFTER LEVELING AND BEFORE COVERING WITH RED CLAY.

WE HOPE TO COMPLETE THIS BEFORE FRIDAY MAY 6, 1994.

SINCERELY,

James Burress

JAMES BURRESS
PLANT MANAGER
SMOKEY MOUNTAIN SMELTERS, INC.

JB/tdk

MAY 5 1994

SMOKEY MOUNTAIN SMELTERS, INC.
P.O. BOX 2704 • KNOXVILLE, TENNESSEE 37901 • PHONE: (615) 573-4473 • FAX: 573-9546

" Complaint "

Duncan, J. 1983. (Congress of the United States). Letter to J. Lovett (Director of Knox County Department of Air Pollution Control), RE: Complaint, July 27.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

JOHN J. DUNCAN
2D DISTRICT, TENNESSEE

2458 RAYBURN HOUSE OFFICE BUILDING
PHONE: (AREA CODE 202) 225-5435

COUNTIES:
BLOUNT
KNOX
LOUDON
McMINN
MONROE
POLK

Congress of the United States
House of Representatives
Washington, D.C. 20515

COMMITTEE:
WAYS AND MEANS
SUBCOMMITTEES:
SELECT REVENUE MEASURES
HEALTH
OVERSIGHT
JOINT COMMITTEE ON TAXATION

July 27, 1983

Mr. James Lovett
Director
Air Pollution Control Office
City/County Building
Suite L 222
400 Main Avenue
Knoxville, Tennessee 37902

Dear Mr. Lovett:

I am attaching hereto a letter I have received from Mrs. Rosalie Taylor and Mrs. Haskell Brown, members of my constituency.

It would be greatly appreciated if you could investigate the allegations contained in their correspondence and furnish me with a reply suitable for forwarding to these ladies.

I thank you for your courtesy in this matter.

Very truly yours,

John J. Duncan

JOHN J. DUNCAN
Member of Congress

JJD:ba

Enclosure

RECEIVED
JUL 1983
JOHN J. DUNCAN, M.C.
KNOXVILLE

July 19, 1983

(b) (6)

Congressman: John J. Duncan:
Dear Sir;
Isnt there something that can be done about the "Rotary Furnace" on Maryville Pike? I have called the Air Pollution Center again, and they are still keeping this area surrounded by the terrible smoke, fumes and odor. They didnt even stop when we had the hot, dry weather. We have a very hard time sleeping at night. Right now, (after a storm) it is cool, and very pleasant weather, but I am going to have to close my doors, and windows, its so bad. It is making my husband, and I cough; and it's hard to breathe at times, because that is all we can breathe. It is now 9 O'Clock p.m, and it will be this way all night. All we are asking you is air to breathe. Will you help us please. People from all around here said it bothers them terrible, but they

weren't sure where it came from, but we live across the street, and ~~some~~ every night our house is just surrounded by smoke, you can see it floating across the roof. This is what I call hazardous to your health.

Please contact some-one, and get them to correct this. The last time I called the Center - 521-2488. They came out, "A man was burning brush in his yard at the same time," They talked to the man, and sent out two trucks to put out the fire. I talked to them about the factory, and they went out there: Then I received a letter telling me they had made the man extinguish the fire, but the factory had no violation. This is hard to believe. The heard that they made them move out of the city, because of the smoke, and fumes, and we sure hope something can be done.

Thank you,

(b) (6)

" Analytical Results of Sample "

IT. 1990. International Technology Corporation Analytical Services. "Analytical Results of Sample". September 24.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

RSB 10-11-90
File; Special waste,
Knox Co.

INTERNATIONAL
TECHNOLOGY
CORPORATION

TELECOPY # 573-9546

TO: Smoky Mtn. Smelters

FROM: Kim Laisy

DATE: 9-24-90

PAGE: 1 OF 14

☐ DISCARD WHEN SENT

☐ PLEASE RETURN

CONTACT:

RECEPTIONIST
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921
615-588-6401

NOTES: Copy sent to Waste Management

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Waste Management Inc., Knoxville
P.O. Box 12209
Knoxville, TN 37912
ATTN: Larry Tackett

September 24, 1990

Job Number: WMIK 46378

P.O. Number: NA

This is the Certificate of Analysis for the following sample:

Client Project ID: Smokey Mtn. Smelters
Date Received by Lab: 08/13/90
Number of Samples: One (1)
Sample Type: Solid

METALS ANALYSIS
Results in mg/liter (ppm) in the extract

Client Sample ID:	Method Blank/TCLP Blank	Smokey Mtn. Smelters
Lab Sample ID:	PBE0045	LL5296
arsenic	0.03 U	0.42
barium	0.002 U	0.72
cadmium	0.005 U	0.005 U
chromium	0.01 U	0.38
lead	0.03 U	0.03 U
mercury	0.001 U	0.001 U
selenium	0.06 U	0.06 U
silver	0.005 U	0.005 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 08/23/90 Date Digested: 09/02/90
Date Analyzed: 09/13/90 (ICP); 08/27/90 (CVAA)

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 11363-11875.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters

Job Number: WMIK 46378

CLASSICAL PARAMETERS ANALYSIS

Results in mg/kg (ppm) unless otherwise stated

Sample Matrix: Solid

Client Sample ID: Lab Sample ID:	Smokey Mtn. Smelters LL5296	Analysis Date
pH (standard units)	8.05	08/17/90
% Solids (%)	98.5	08/17/90
Filter Paint Test	No Free Liquids	08/17/90
Specific Gravity	2.300	08/17/90

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

582-1-88

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters Job Number: WMIK 46378

REACTIVITY, AS CYANIDE AND SULFIDE

Results in mg/kg (ppm)

Sample Matrix: Solid

Client Sample ID: / Lab Sample ID:	Method Blank / P1434/P1420	Smokey Mtn. Smelters / LL5296	Analysis Date
Cyanide	0.5 U	0.5 U	08/21/90
Sulfide	80 U	80 U	08/15/90

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters Job Number: WMIK 46378

TCLP VOLATILE COMPOUNDS

Results in µg/liter (ppb) in the extract

Sample Matrix: Solid

Client Sample ID: Method Blank
Lab Sample ID: EB0904

Compound	
acrylonitrile	10 U
benzene	5 U
carbon disulfide	5 U
carbon tetrachloride	5 U
chlorobenzene	5 U
chloroform	1 J
1,2-dichloroethane	5 U
1,1-dichloroethene	5 U
isobutanol	2,000 U
methylene chloride	2 J
methyl ethyl ketone	10 U
1,1,1,2-tetrachloroethane	5 U
1,1,2,2-tetrachloroethane	2 J
tetrachloroethene	5 U
toluene	5 U
1,1,1-trichloroethane	5 U
1,1,2-trichloroethane	5 U
trichloroethene	5 U
vinyl chloride	10 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date Analyzed: 09/04/90

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 11863-11875.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters

Job Number: WMIK 46378

TCLP VOLATILE COMPOUNDS

Results in µg/liter (ppb) in the extract

Sample Matrix: Solid

Client Sample ID: TCLP Blank
Lab Sample ID: C0056

Compound		
acrylonitrile	10	U
benzene	5	U
carbon disulfide	5	U
carbon tetrachloride	5	U
chlorobenzene	5	U
chloroform	5	U
1,2-dichloroethane	5	U
1,1-dichloroethene	5	U
isobutanol	2,000	U
methylene chloride	2	J
methyl ethyl ketone	38	
1,1,1,2-tetrachloroethane	5	U
1,1,2,2-tetrachloroethane	5	U
tetrachloroethene	5	U
toluene	5	U
1,1,1-trichloroethane	5	U
1,1,2-trichloroethane	5	U
trichloroethene	5	U
vinyl chloride	10	U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

TCLP Extracted: 08/28/90
Date Analyzed: 09/04/90

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 11863-11875.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters Job Number: WMIK 46378

TCLP VOLATILE COMPOUNDS

Results in μg/liter (ppb) in the extract

Sample Matrix: Solid

Client Sample ID: Smokey Mtn. Smelters
Lab Sample ID: LL5296

Compound	
acrylonitrile	10 U
benzene	5 U
carbon disulfide	7
carbon tetrachloride	5 U
chlorobenzene	5 U
chloroform	2 J
1,2-dichloroethane	5 U
1,1-dichloroethene	5 U
isobutanol	2,000 U
methylene chloride	1 J
methyl ethyl ketone	11
1,1,1,2-tetrachloroethane	5 U
1,1,2,2-tetrachloroethane	5 U
tetrachloroethene	5 U
toluene	8
1,1,1-trichloroethane	5 U
1,1,2-trichloroethane	5 U
trichloroethene	5 U
vinyl chloride	10 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

TCLP Extracted: 08/28/90
Date Analyzed: 09/04/90

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 11863-11875.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters

Job Number: WMIK 46378

WATER SURROGATE PERCENT RECOVERY SUMMARY

	VOLATILE		
Sample No.	Toluene-D8 (88-110%)*	BFB (86-115%)*	1,2 Dichloroethane-D4 (76-114%)*
Method Blank	93	92	97
TCLP Blank	87	88	83
Smokey Mtn. Smelters	87	89	86

* - Values in parenthesis represent USEPA contract required QC limits.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters

Job Number: WMIK 46378

TCLP SEMIVOLATILE COMPOUNDS

Results in μg/liter (ppb) in the extract

Sample Matrix: Solid

Client Sample ID: Method Blank
Lab Sample ID: BLA1580

Compound	
bis(2-chloroethyl)ether	10 U
o-cresol	10 U
m-cresol	10 U
p-cresol	10 U
1,2-dichlorobenzene	10 U
1,4-dichlorobenzene	10 U
2,4-dinitrotoluene	10 U
hexachlorobenzene	10 U
hexachlorobutadiene	10 U
hexachloroethane	10 U
nitrobenzene	10 U
pentachlorophenol	50 U
phenol	10 U
pyridine	100 U
2,3,4,6-tetrachlorophenol	10 U
2,4,5-trichlorophenol	50 U
2,4,6-trichlorophenol	10 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

TCLP Extracted: 08/23/90
Date Extracted: 08/23/90
Date Analyzed: 08/27 - 09/04/90

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 1.863-11875.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters   Job Number: WMIK 46378

TCLP SEMIVOLATILE COMPOUNDS

Results in ug/liter (ppb) in the extract

Sample Matrix: Solid

Client Sample ID: TCLP Blank
Lab Sample ID: E0040

Compound	
bis(2-chloroethyl)ether	10 U
o-cresol	10 U
m-cresol	10 U
p-cresol	10 U
1,2-dichlorobenzene	10 U
1,4-dichlorobenzene	10 U
2,4-dinitrotoluene	10 U
hexachlorobenzene	10 U
hexachlorobutadiene	10 U
hexachloroethane	10 U
nitrobenzene	10 U
pentachlorophenol	50 U
phenol	10 U
pyridine	100 U
2,3,4,6-tetrachlorophenol	10 U
2,4,5-trichlorophenol	50 U
2,4,6-trichlorophenol	10 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

TCLP Extracted: 08/23/90
Date Extracted: 08/23/90
Date Analyzed: 08/27 - 09/04/90

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 11863-11875.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters Job Number: WMIK 46378

TCLP SEMIVOLATILE COMPOUNDS

Results in μg/liter (ppb) in the extract

Sample Matrix: Solid

Client Sample ID: Smokey Mtn. Smelters
Lab Sample ID: LL5296

Compound	
bis(2-chloroethyl)ether	10 U
o-cresol	10 U
m-cresol	10 U
p-cresol	10 U
1,2-dichlorobenzene	10 U
1,4-dichlorobenzene	10 U
2,4-dinitrotoluene	10 U
hexachlorobenzene	10 U
hexachlorobutadiene	10 U
hexachloroethane	10 U
nitrobenzene	10 U
pentachlorophenol	50 U
phenol	10 U
pyridine	100 U
2,3,4,6-tetrachlorophenol	10 U
2,4,5-trichlorophenol	50 U
2,4,6-trichlorophenol	10 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

TCLP Extracted: 08/23/90
Date Extracted: 08/23/90
Date Analyzed: 08/27 - 09/04/90

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 11363-11875.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters Job Number: WMIK 46378

WATER SURROGATE PERCENT RECOVER SUMMARY

	SEMI-VOLATILE					
Sample No.	Nitro-Benzene-D5 (35-114%)*	2-Fluoro-Biphenyl (43-116%)*	Terphenyl-D14 (33-141%)*	Phenol-D5 (1[illegible]-94%)*	2-Fluoro-Phenol (21-100%)*	2,4,6 Tribromo-Phenol (10-123%)*
TCLP Blank	80	74	86	30	55	94
Smokey Mtn. Smelters	73	62	87	15	28	63
Method Blank	76	77	88	30	49	91

* - Values in parenthesis represent USEPA contract required QC limits.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Waste Management Inc., Knoxville
September 24, 1990

Client Project ID: Smokey Mtn. Smelters Job Number: WMIK 46378

TCLP PESTICIDES AND HERBICIDES

Results in mg/liter (ppm) in the extract

Sample Matrix: Solid

Client Sample ID: / Lab Sample ID:	TCLP Blank E0042	Smokey Mtn. Smelters LL5296	TCLP Blank E0041	Method Blank BLA1596/BLA1582
lindane	0.0001 U	0.0001 U	0.0001 U	0.0001 U
endrin	0.0001 U	0.0001 U	0.0001 U	0.0001 U
heptachlor	0.0001 U	0.0001 U	0.0001 U	0.0001 U
heptachlor epoxide	0.0001 U	0.0001 U	0.0001 U	0.0001 U
methoxychlor	0.0001 U	0.0001 U	0.0001 U	0.0001 U
chlordane	0.0004 U	0.0004 U	0.0004 U	0.0004 U
toxaphene	0.0004 U	0.0004 U	0.0004 U	0.0004 U
2,4-D	0.0002 U	0.0003 U*	0.0002 U	0.0002 U
2,4,5-TP (Silvex)	0.0001 U	0.0002 U*	0.0001 U	0.0001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
* - Higher detection limit due to matrix interferences.

Sample extracted in accordance with the, "Toxicity Characteristic Leaching Procedure," Federal Register, Vol. 55, No. 61, pp. 11863-11875.

TCLP Extracted: 08/23/90
Date Extracted: 08/27/90
Date Analyzed: 08/31 and 09/10/90

HARRY W. GALBRAITH, PH.D
CHAIRMAN OF THE BOARD

KENNETH S. WOODS
PRESIDENT

GAIL R. HUTCHENS
EXECUTIVE VICE-PRESIDENT

VELMA M. RUSSELL
SECRETARY/TREASURER

GALBRAITH
Laboratories, Inc.

QUANTITATIVE MICROANALYSES
ORGANIC – INORGANIC

P.O. BOX 51610
KNOXVILLE, TN 37950-1610

615/546-1335

2323 SYCAMORE DR.
KNOXVILLE, TN 37921-1750

Ms. Kim Laisy
IT Corporation
5815 Middlebrook Pike
Knoxville, Tennessee 37921

August 17, 1990

Received: Aug. 13th
Proj.#: WMIK46378
PO#: 532116

Dear Ms. Laisy:

Analysis of your compound gave the following results

Your #,	Our #,	Flash Point(Tag Closed Cup),	Date Analyzed & Prepped,
LL5297	N-0586	No flash below 145°F	8/14/90

Smokey Mtn. Smelters
Test flame extinguished above 97°F, had a halo at all temperatures.

Sincerely yours,

GALBRAITH LABORATORIES, INC.

Gail R. Hutchens/ew

Gail R. Hutchens,
Exec. Vice-President

GRH:ew

" Permit Application "

KCDAPC. 1980. Permit Application, Form APC-1. Received by the Knox County Department of Air Pollution Control, filed by Dan E. Johnson, President, Smokey Mountain Smelters, Inc. November 7.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

PERMIT APPLICATION G. ERAL INFORMATION

(PLEASE TYPE OR PRINT)

DO NOT WRITE IN THIS SPACE

FACILITY NUMBER 10/5/1/4/

EW UTM 12/3/5/.1/9/

NS UTM 13/9/7/8/.7/

REVIEWER /E/0/5/

DATE 10/6/25/8/1/

1. BUSINESS LICENSE NAME OF CORPORATION, COMPANY INDIVIDUAL OWNER OR GOVERNMENTAL AGENCY UNDER WHICH APPLICATION IS SUBMITTED:

SMOKEY MOUNTAIN SMELTERS, INC

2. MAILING ADDRESS P.O. BOX 2704

KNOXVILLE, TN 37901
CITY ZIP CODE

3. ADDRESS AT WHICH SOURCE IS TO BE OPERATED:

1455 MARYVILLE PIKE KNOXVILLE, TN 37920
ADDRESS CITY ZIP CODE

4. TYPE OF ORGANIZATION: CORPORATION ☑ INDIVIDUAL ☐ PARTNERSHIP ☐ GOVERNMENTAL AGENCY ☐

5. BRIEF DESCRIPTION OF OPERATION AT THIS ADDRESS: ALUMINUM SMELTER (MELTING OPERATION)

6. COST OF AIR POLLUTION CONTROL EQUIPMENT: $ ______

7. PRESENT STATUS OF AIR CONTAMINANT SOURCE (CHECK AND COMPLETE APPLICABLE ITEMS)

	EST. STARTING DATE	EST. COMPLETION D
☐ PERMIT TO CONSTRUCT REQUESTED		
☑ PERMIT TO OPERATE REQUESTED		
☐ AIR CONTAMINANT SOURCES HAVE NOT BEEN ALTERED		

8. SIGNATURE OF RESPONSIBLE MEMBER OF FIRM

Dan E. Johnson

DATE OF APPLICATION 11-7-80

9. TYPE OR PRINT NAME AND OFFICIAL TITLE OF PERSON SIGNING THIS APPLICATION

NAME DAN E. JOHNSON

TITLE PRESIDENT

PHONE (615) 577-8986

FOR OFFICE USE ONLY

10. SOURCES PERMITTED

SOURCE	PERMIT NO.
Aluminum Smelter 0514-01 →	

11. TOTAL ACTUAL EMISSIONS (TONS/YR)

PARTICULATE ______ HC ______

SO_2 ______ CO ______

NO_x ______ OTHER ______

" Facility Inspection Report,

David Witherspoon, Inc.

Witherspoon and Johnson Dump "

KCDAPC. 1983. Facility Inspection Report, David Witherspoon, Inc. - Witherspoon and Johnson Dump. Inspected by the Knox County Department of Air Pollution Control, December 5.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

4/12/16/'0

CC 12-4-83
Jn. 12-12-83
LS7 12/12/83

FACILITY INSPECTION REPORT

[David Witherspoon, Inc]

FACILITY Witherspoon & Johnson Dump DATE 12/5/83

LOCATION 1455 Maryville Pike TIME 2:30 P.M.

NAME AND TITLE OF PERSON CONTACTED N/A

PURPOSE OF INSPECTION Open Burning Compliance

COMMENTS: Inspector Liddington & I made circuit of dump & perimeter; extensive work had been done in burying everything on the surface, except for some of the slag from the smelting operation.

A small smoke plume was found in the southern portion of the perimeter. (see photo and sketch). The smoke carried a pervasive musty stink. The rest of the dump had the typical ammonia odor.

L.L. and I walked up the south path to the train tracks; (S.R.R.) to confirm no fencing or any type has been installed: Dump is not fenced in on all sides.

Violation

Recommend NOV to Source; copy to Law Dept, (Judge Cates?)

After review w/JC, decision was made to send NOV to Source with copy to Law Dept. LL

INSPECTOR William D. Schaad, III
& Lynne Liddington

4 13

" David Witherspoon - Historical Record "

KCDAPC. 1985. "David Witherspoon - Historical Record", Knox County Department of Air Pollution Control.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

DAVID WITHERSPOON

Historical Record

Date	Location	Nature	Result	File
03-29-85	901 Maryville Pike	Open Burning	No Violation	Inspection
11-16-84	1455 Maryville Pike	Odor	No Violation	Inspection
11-15-84	1455 Maryville Pike	Open Burning	No Violation	Inspection
08-21-84	901 Maryville Pike	Open Burning	Violation	Complaint
04-19-84	1455 Maryville Pike	Open Burning	No Violation	Inspection
04-16-84	1455 Maryville Pike	Open Burning	No Violation	Inspection
04-11-84	1455 Maryville Pike	Open Burning	No Violation	Inspection
03-05-84	1455 Maryville Pike	Open Burning	Violation	Inspection
01-19-84	1455 Maryville Pike	Open Burning	No Violation	Inspection
01-05-84	1455 Maryville Pike	Open Burning	No Violation	Inspection
12-20-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
12-16-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
12-06-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
12-05-83	1455 Maryville Pike	Open Burning	Violation	Inspection
10-01-83	KCAPC Sues David Witherspoon, Jr. and Dan Johnson over open burning at 1455 and 1630 Maryville Pike. Judge sets temporary injunction against any open burning on these properties. Injunction lifted in Spring 1984.			
09-12-83	1455 Maryville Pike	Open Burning	Violation	Complaint
	1630 Maryville Pike	Open Burning	No Violation	Inspection
09-07-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
09-01-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
08-20-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
08-18-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
08-15-83	1455 Maryville Pike	Open Burning	Violation	Inspection
08-11-83	1455 Maryville Pike	Open Burning	Violation	Inspection
08-02-83	1455 Maryville Pike	Open Burning	Violation	Inspection
07-25-83	1630 Maryville Pike	Open Burning	Violation	Complaint
07-12-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
06-29-83	1455 Maryville Pike	Open Burning	Violation	Inspection
06-28-83	1455 Maryville Pike	Open Burning	Violation	Inspection
06-21-83	1455 Maryville Pike	Open Burning	Violation	Inspection
06-06-83	Referred to Knox County Law Dept. for injunctive relief.			
05-24-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
05-16-83	1455 Maryville Pike	Open Burning	No Violation	Complaint
05-12-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
05-11-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
05-10-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
04-27-83	1455 Maryville Pike	Open Burning	Violation	Complaint
04-04-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
03-31-83	1455 Maryville Pike	Open Burning	Violation	Inspection
03-28-83	1455 Maryville Pike	Open Burning	Violation	Inspection
03-22-83	1455 Maryville Pike	Open Burning	Violation	Complaint
03-15-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
03-14-83	1455 Maryville Pike	Open Burning	Violation	Complaint
03-07-83	1455 Maryville Pike	Open Burning	Violation	Complaint
03-04-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
03-03-83	1455 Maryville Pike	Open Burning	No Violation	Inspection

Date	Location	Nature	Result	File
03-02-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-21-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-18-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-17-83	1455 Maryville Pike	Open Burning	Violation	Complaint
02-11-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-09-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-08-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-07-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-04-83	1455 Maryville Pike	Open Burning	No Violation	Inspection
02-03-83	1455 Maryville Pike	Open Burning	Violation	Inspection
02-01-83	1455 Maryville Pike	Open Burning	Violation	Complaint
01-31-83	1455 Maryville Pike	Open Burning	No Violation	Complaint
01-28-83	Letter to David Witherspoon, Jr. from Knox County Law Dept. directing him to take immediate action to remedy the situation or face a possible injunction.			
01-28-83	1455 Maryville Pike	Open Burning	Violation	Inspection
01-27-83	1455 Maryville Pike	Open Burning	Violation	Inspection
01-26-83	1455 Maryville Pike	Open Burning	Violation	Complaint
01-25-83	1455 Maryville Pike	Open Burning	Violation	Complaint
01-24-83	1455 Maryville Pike	Open Burning	Violation	Complaint
01-20-83	1455 Maryville Pike	Open Burning	Violation	Inspection
01-19-83	1455 Maryville Pike	Open Burning	Violation	Complaint

" List of complaints, inspections, and Departmental action "

KCDAPC. 1989. "List of complaints, inspections, and Departmental action", Knox County Department of Air Pollution Control, August 10.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

6R 8/14/89

SUMMARY REPORT

DATE: 8/10/89

SUBJECT: Chronological list of complaints, inspections and Departmental action concerning Smokey Mountain Smelters from 1/23/89 to 8/10/89.

DATE	TYPE OF EVENT AND ACTION TAKEN
1/23/89	Complaint. Complainant called the Department concerning heavy emissions from S.M.S.
1/23/89	Complaint Inspection. R.J. and I inspected S.M.S. and read V.E.'s at 35%. R.J. noted that emissions were escaping the capture hoods above the rotary kilns. N.O.V. was sent to the source. Turnaround date on A.P.C. 13 form was 2/7/89.
2/15/89	Received A.P.C. 13. A.P.C. 13 form was returned 8 days late. S.M.S. determined that a storm damaged portion of the furnace building was responsible for excessive emissions. The A.P.C. 13 states that repairs were made on 2/10/89.
4/7/89	Complaint. Ms. Keith reported excessive smoke from S.M.S.
4/7/89	Complaint Inspection. W.S. and I investigated the complaint. Fugitive emissions was escaping at the roof top and was read at 31%. Video tape and a photograph was taken of the incident. The excessive emissions were attributed to a malfunction of the baghouse. The malfunction was not reported to the Department. W.S. indicated to Mr. Russell the reporting requirements concerning malfunctions of equipment (Reg. 34.0), and that the Department will require a formal correspondence concerning the reason for the malfunction. No N.O.V. was issued.
4/13/89	Correspondence from S.M.S. Mr. Russell sent formal correspondence explaining the malfunction of the baghouse controls. Mr. Russell stated that water seepage clogged (3) bags in the baghouse. The letter indicates that the corrective action taken was the replacement of the (3) bags.
4/24/89	Correspondence from K.C.A.P.C. W.S. sent out formal correspondence asking S.M.S. why the Department was not notified of the 4/7/89

baghouse malfunction and what actions S.M.S. would take in the future to prevent the failure of notifying the Department of a malfunction.

4/28/89 <u>Correspondence from S.M.S.</u> Mr. Russell indicated in a letter to the Department that an illness in the family had prevented him from being on his normal shift. Thus, Mr. Russell had not sufficient time to notify the Department, being he had just arrived. He also stated that shift managers Tommy Edmonds and Mike Daniels would contact the Department concerning a malfunction if he were not available.

5/11/89 <u>Complaint.</u> Maxine Johnson reported excessive emissions from 9:00 P.M. to 1:30 A.M. on 5/10-11/89. No inspection was made due to the time of complaint. Nighttime surveillance of S.M.S. was discussed.

5/18/89 <u>Complaint.</u> An anonymous complainant reported excessive emissions at 4:25 P.M. No inspection was made due to the time of the complaint. No complaints were reported the following day.

5/24/89 <u>Compliance inspection</u>. The #1 baghouse was being repaired (to correct roof and floor problems). I met with Mr. Glenn Riggs (Purchasing Director) who is the temporary General Manager (Fred Russell is no longer with the company). During my discussion with Mr. Riggs, I brought up two points:

#1 I made Mr. Riggs aware of the Department's concern about nighttime emissions at S.M.S. I reminded Mr. Riggs that all of the plant operators should be aware of the proper and effective operations of the smelting process and baghouse controls with regard to K.C.A.P.C. Regulations.

#2 I reminded Mr. Riggs of Regulation 34.0 (Malfunction of Equipment), and that failure to immediatly contact the Department concerning a malfunction would violate Regulation 34.0.

6/20/89 <u>Complaint</u>. Mr. Harry Lebo reported heavy emissions from S.M.S. "all morning" (as reported on the complaint report). He noted that the emissions made it hard to breath.

6/20/89 <u>Complaint inspection</u>. An on-site inspection showed an obvious problem with baghouse control efficiency (fugitives were regularly crossing the property line). I contacted Mr. Riggs inside his office and showed him the heavy emissions. He proceeded to immediatly shut the furnace off and determine the problem with the baghouse. I again reminded Mr. Riggs of Regulation 34.0. An N.O.V. was not sent to S.M.S. due to Mr. Riggs lack of familiarity with the standard procedures and requirements required of him in dealing with air pollution issues.

6/22/89	Correspondence from S.M.S. Mr. Riggs contacted me by phone regarding the high stack emissions from #2 baghouse on 6/20/89. He explained that several of the bags were improperly installed and had come off the hangers.
6/29/89	Compliance inspection. B.R. and I made a compliance inspection to determine whether the corrective measures taken by S.M.S. would alleviate the visible emissions problem S.M.S. encountered on 1/23/89. I watched the smelting process while B.R. took V.E. readings. The facility conformed to K.C.A.P.C. Regulations and the corrective actions (A.P.C. 13) were approved.
8/1/89	Complaint (12:15 P.M.). Ms. Mara Brown contacted the Department concerning heavy fugitive emissions from S.M.S. She said the condition had going on throughout the morning.
8/1/89	Complaint (12:15 P.M.). Ms. Rosalie Taylor contacted the Department concerning heavy fugitive emissions coming from S.M.S.. She reported that the emissions have been present throughout the morning and that the emissions burn her throat.
8/1/89	Complaint (4:00 P.M.). Ms. Helen Smithwick contacted the Department concerning heavy fugitive emissions coming from S.M.S.. She noted that the emissions were especially bad at night.
8/1/89	Complaint inspection. V.E.'s were taken on the fugitive emissions exiting the roof top. A six minute reading recorded an opacity of 85%. I then proceeded to the plant to investigate the problem. The fugitive emissions were not being pulled through the #2 capture hood, thus escaping around the edges. Inspection of the baghouse #2 showed seven seperate vacuum breaches of the closed, negative pressure baghouse. These breaches were located at: 1) hopper panels, 2) inspection panels, 2) ducting. Mr. Riggs and Tommy Edmonds seemed unware of a problem until I addressed it. I mentioned the possibility of the

vacuum breaches being part of the containment problem. However, I told them that the vacuum breaches may not be the only problem with the A.P.C. system, hence the breaches may not solve the problem with excessive fugitive emissions. They immediately shut the system down to determine the problem with the baghouse. (Department action pending)

8/4/89 <u>Drop-by compliance inspection</u>. B.R. and I went to S.M.S. to follow up on what the facility determined was the problem on 8/1/89 and to gather additional information concerning the non compliance episode of 8/1/89. Both furnaces were down and maintainence was being done to the #2 baghouse. Panels were being repaired to eliminate the vacuum breaches in the baghouse. Investigation of the plant site revealed melt materials that does not conform to 11/28/84 agreement made between K.C.D.A.P.C. and S.M.S. These materials were aluminum trim/siding. Approximately 90% of the material was painted and rubber trim was also observed in the same pile. Photos were taken on the inspection and are documented accordingly:

#1 Smokey Mountain Smelters.

#2 Vacuum breach on #2 baghouse hopper.

#3 Vacuum breach on #1 baghouse hopper (it was not being repaired at that time).

#4 Damage to #2 baghouse hopper.

#5 Panel installed to replace damaged hopper bin panel on #2 baghouse.

#6 Repaired and damaged hopper bins on #2 baghouse.

#7 Inspection panel openings to be replaced. *Note: Look closely above the second and third bag from the right near the bottom of the picture. These are holes in the baghouse floor.

#8 Aluminum trim/siding next to east entrance near #1 furnace.

#9 Aluminum trim/siding.

(Department action pending)

" Disposal of Slag from RF/SMS operations "

KCDAPC. 1984. "Disposal of Slag from RF/SMS operations", memo to L.L., J.C., J.L. (KCAPC), from W. Schaad, dated February 8.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

DEPARTMENT OF AIR POLLUTION CONTROL
ROOM L-222, CITY-COUNTY BUILDING
400 MAIN AVENUE
KNOXVILLE, TENNESSEE 37902

TELEPHONE: 521-

MEMORANDUM 2-9-84 2-9-84 2/10/84

TO: D LL, JC, JGL;

File: Rotary Furnace, Smokey Mountain Sm - Corresp.

FROM: W.S.

DATE: 2/8/84

TIME: 4:15P.M

SUBJECT: Disposal of Slag from RF/SMS operations; // Asbestos

Jack Crabtree of TN. Div. of Solid Waste MGMT. stated that RF/SMS had agreed to dispose of slag materials @ BFI Landfill. Stated that he was unaware of asbestos siding at building (being removed), but that Rick Brown (S.W.M.) is working with that asbestos issue.

how do we know there is asbestos.

Asbestos samples were taken from dump behind Screen arts ~~[illegible]~~ Ave., analyzed for asbestos, proved very positive.

See letter from TAPC dated 10/17/83 - asbestos file
" " " KCAPC " 9/19/83 - " "
" Inspection Report, Witherspoon Dump 9/12/83

[over]

Note: Though it doesn't appear to be noted elsewhere in file, the old siding on the building (1455 Maryville, is this same material. If there is ~~any~~ any doubt (I've none, we can have a sample tested by TN. APC.

Note: 2/10/84; 2:10 P.M. Rick Brown of Solid Waste Mgmt stated Jack Crabtree was only person dealing w/ RF/SMS. he has not address asbestos-siding to Mr. Johnson or Mr Witherspoon

Strongly suggest ~~formal letter be sent to SWM to "enlighten" them of potential problem and settle issue.~~

" Estimation of the groundwater pathway secondary target population "

Maupin, B.H. (TDEC/DSF). 1997a. Estimation of the groundwater pathway secondary target population. December 1997.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

ESTIMATION OF THE GROUNDWATER PATHWAY SECONDARY TARGET POPULATION

The total area of Knox County is approximately 329,600 acres, or 515 square miles (USDA/SCS 1955).

The 1990 Census revealed that in the Knoxville Metropolitan Statistical Area there were 2.56 persons per occupied housing unit (USBC 1990).

The 1990 Census revealed that in Knox County, individual wells were the source of water for 6026 housing units (USBC 1990). This amounts to 15,400 persons, in the entire county, or, proportionally, approximately 1500 in the 4 miles radius, or 50.3 square miles, study area.

Proportioned by area, by distance category, the following target populations have been estimated:

0 to ¼ mile	6
¼ to ½ mile	17
½ to 1 mile	71
1 to 2 miles	281
2 to 3 miles	468
3 to 4 miles	657
0 to 4 miles	1500

" Hazardous waste quantity calculation "

Maupin, B.H. (TDEC/DSF). 1997b. Hazardous waste quantity calculation. December 1997.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

HAZARDOUS WASTE QUANTITY CALCULATION

The waste quantity is estimated from observations of waste locations made during Site investigations made during October 1997 (which are depicted in the Site Sketch, Figure IV), by using a conservative minimum outside waste depth of two feet (which was noted during collection of Sample WA-04) and inside waste depth of one-half foot, and by using the property boundary lengths noted on the property map, Figure 3, and on the Ownership Cards in Appendix 1.

The outside waste area was estimated to be approximately 160,000 ft^2. The waste inside the building was estimated to cover approximately 7,500 ft^2. Total minimum volume was estimated to be 1,190 cubic yards, outside, and 139 cubic yards, inside.

" Letters to Daniel E. Johnson

(Property Owner), RE: Site Entry "

Maupin, B. H. 1997c. (TDEC/DSF). Letters to Daniel E. Johnson (Property Owner), RE: Site Entry - Smokey Mountain Smelters. Tennessee Department of Environment and Conservation/Division of Solid Waste Management. September 9.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

FILE COPY

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
KNOXVILLE ENVIRONMENTAL FIELD OFFICE
2700 MIDDLEBROOK PIKE, SUITE 220
KNOXVILLE, TENNESSEE 37921-5602
(615) 594-6035 FAX (615) 594-6105

Daniel E. Johnson
P O Box 2704
Knoxville, TN 37901

CERTIFIED MAIL
Return Receipt Requested
P 286 042 086

RE: Smokey Mountain Smelters, Inc.
1508 Maryville Pike
Knox County
Site # 47-559

Dear Mr. Johnson:

The Tennessee Division of Superfund plans to conduct a Preliminary Assessment at the above referenced site. Records obtained from the Property Assessor's Office at the Knox County Courthouse indicate that you are the owner of the property located at 1508 Maryville Pike.

The Division requests your permission to enter the property on Monday, September 15, 1997. Your cooperation in this matter is appreciated.

Please contact me at 423/594-5479, as soon as possible, if there are any questions, or if I may provide additional information. Thank you.

Sincerely,
Burl H. Maupin
Burl H. Maupin
Division of Superfund

cc: DSF Central Office, Site # 47-559 file

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
KNOXVILLE ENVIRONMENTAL FIELD OFFICE
2700 MIDDLEBROOK PIKE, SUITE 220
KNOXVILLE, TENNESSEE 37921-5602

DSF

CERTIFIED

P 286 042 086

MAIL

KNOXVILLE TN SEP -9 '97

2.77

P.B. METER 5187790

U.S. POSTAGE

RETURNED TO SENDER

ATTEMPTED NOT KNOWN

Mr. Daniel E. Johnson
P.O. Box 2704
Knoxville, Tennessee 37901

no 2704
37901

OCT 10 1997

9-10
9-17

2704

37901-2704

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
KNOXVILLE ENVIRONMENTAL FIELD OFFICE
2700 MIDDLEBROOK PIKE, SUITE 220
KNOXVILLE, TENNESSEE 37921-5602
(615) 594-6035 FAX (615) 594-6105

CERTIFIED MAIL
Return Receipt Requested
P 286 042 087

(b) (6)
912 S. Gay Street, Suite 1600
Knoxville, TN 37902

RE: Smokey Mountain Smelters, Inc.
1508 Maryville Pike
Knox County
Site # 47-559

Dear (b) (6) :

The Tennessee Division of Superfund plans to conduct a Preliminary Assessment at the above referenced site. Records obtained from the Property Assessor's Office at the Knox County Courthouse indicate that you are the owner of the property located at 1508 Maryville Pike.

The Division requests your permission to enter the property on Monday, September 15, 1997. Your cooperation in this matter is appreciated.

Please contact me at 423/594-5479, as soon as possible, if there are any questions, or if I may provide additional information. Thank you.

Sincerely,
Burl H. Maupin
Burl H. Maupin
Division of Superfund

cc: DSF Central Office, Site # 47-559 file

DSF

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
KNOXVILLE ENVIRONMENTAL FIELD OFFICE
2700 MIDDLEBROOK PIKE, SUITE 220
KNOXVILLE, TENNESSEE 37921-5602

CERTIFIED

P 286 042 087

MAIL

KNOXVILLE TN SEP -9'97
P.B. METER 5187790
2.77
U.S. POSTAGE

Addressee Not Known

ANK
9/10

(b) (6)
912 S. Gay Street, Suite 1600
Knoxville, Tennessee 37902

SEP 12 1997

FILE COPY

37902-1814 30

OF TENNESSEE
ONMENT AND CONSERVATION
ONMENTAL FIELD OFFICE
ROOK PIKE, SUITE 220
ENNESSEE 37921-5602
FAX (615) 594-6105

CERTIFIED MAIL
Return Receipt Requested
P 286 042 087

ns to conduct a Preliminary Assessment at the
om the Property Assessor's Office at the Knox
e the owner of the property located at 1508

enter the property on Monday, September 15,
ppreciated.

n as possible, if there are any questions, or if I
k you.

" Features within a four miles radius of Smokey Mountain Smelters "

Table 1: All Features
Table 2: Schools

Maupin, B.H. (TDEC/DSF). 1997d. "Features within a four miles radius of Smokey Mountain Smelters". December.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

TABLE 1 - **USGS GNIS Query Results**, 7.5' x 7.5' Map: Knoxville

with CERCLA sites and TDEC/DWS 1997 wells added

FEATURES NO MORE THAN ONE QUARTER MILE DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
SMOKEY MOUNTAIN SMELTERS	**Knox**	**Site**	**355509N**	**0835536W**	0
Knox Fertilizer	Knox	well-ind	355512	835533	387.2127
(b) (6)	Knox	well-home	355509	835545	737.496
Kingsley Station	Knox	pop pl	355506N	0835547W	949.7333

FEATURES BETWEEN ONE QUARTER AND ONE HALF MILE DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Deadrick	Knox	well-home	355524	835524	1790.095
South Knoxville Optimist Park	Knox	park	355520N	0835514W	2110.273
(b) (6)	Knox	well-home	355518	835602	2311.865
Maxwell	Knox	well-home	355509	835506	2458.32

FEATURES BETWEEN ONE HALF AND ONE MILE DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Mountain View Church	Knox	church	355531N	0835515W	2788.254
Vestal School	Knox	school	355537N	0835538W	2797.022
(b) (6)	Knox	well-home	355440	835545	2984.494
Vestal	Knox	pop pl	355537N	0835520W	3084.715
(b) (6)	Knox	well-home	355533	835605	3372.711
	Knox	well	355522	835615	3448.747
	Knox	well	355521	835616	3489.372
Rodgers Ridge	Knox	ridge	355446N	0835458W	3867.406
Davis Cemetery	Knox	cemetery	355429N	0835515W	4344.237
(b) (6)	Knox	well-home	355425	835550	4535.263
Mount Olive Cemetery	Knox	cemetery	355430N	0835610W	4784.128
(b) (6)	Knox	well-home	355456	835438	4926.385
Immanuel Baptist Knoxville Church	Knox	church	355552N	0835459W	5251.659

FEATURES BETWEEN ONE AND TWO MILES DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Chapman Ridge	Knox	ridge	355534N	0835633W	5294.501
Candors Mablee	Knox	well-ind	355557	835508	5308.154
Mount Olive	Knox	pop pl	355429N	0835621W	5432.189
Brown Cemetery	Knox	cemetery	355435N	0835440W	5705.566
Mount Olive Elementary School	Knox	school	355425N	0835625W	5947.671
Elliot Bill	Knox	well-home	355449	835646	6072.924
(b) (6)	Knox	well-home	355449	835646	6072.924
Vestal United Methodist Church	Knox	church	355600N	0835451W	6281.966
(b) (6)	Knox	well-home	355408	835510	6445.356
Bethel Church (historical)	Knox	church	355415N	0835620W	6480.585
Bethel Cemetery	Knox	cemetery	355413N	0835617W	6517.169
(b) (6)	Knox	well-home	355442	835421	6709.723
	Knox	well-home	355425	835430	6964.356
	Knox	well	355358	835555	7249.425
	Knox	well-home	355426	835423	7360.069
	Knox	well-home	355404	835619	7377.745
Williams-Henson Boys Home	Knox	building	355404N	0835619W	7377.745
Mary Vestal Park	Knox	park	355615N	0835455W	7389.571
Mount Olive Baptist Church	Knox	church	355815N	0835421W	7493.877
Barber Hill	Knox	summit	355513N	0835709W	7631.224
(b) (6)	Knox	well-home	355420	835422	7787.621
Young High School	Knox	school	355600N	0835421W	7977.245
(b) (6)	Knox	well-home	355410	835430	7991.65
Mooreland Heights Elementary School	Knox	school	355507N	0835358W	8032.988
(b) (6)	Knox	well-home	355408	835430	8139.604
South Knoxville Post Office	Knox	post office	355604N	0835422W	8176.331
Wise Hill	Knox	summit	355539N	0835400W	8416.282
Looney Shoals	Knox	rapids	355545N	0835709W	8424.044
Dunford R E	Knox	well-home	355533	835715	8458.13
Spring Creek	Knox	stream	355532N	0835716W	8509.337
Flenniken Elementary School	Knox	school	355623N	0835444W	8521.316
Clark Home Builders	Knox	well-home	355343	835545	8607.744
Young High School Church of Christ	Knox	church	355553N	0835404W	8722.771
Third Creek	Knox	stream	355634N	0835607W	8848.83
University of Tennessee Hospital Airport	Knox	airport	355623N	0835636W	8867.317
Parkway Shopping Center	Knox	locale	355619N	0835429W	8880.921
Looney Islands	Knox	island	355544N	0835717W	8982.197
University Hospital	Knox	hospital	355626N	0835636W	9117.793
Ginn Cemetery	Knox	cemetery	355436N	0835720W	9135.481
	Knox	well-home	355500	835730	9384.631

TABLE 1 (continued)-USGS GNIS Query Results, 7.5'x7.5' Map:Knoxville, with TDEC/DWS 1997 wells added

FEATURES BETWEEN ONE AND TWO MILES DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Woodlawn Cemetery	Knox	cemetery	355601N	0835400W	9421.976
Goose Creek	Knox	stream	355646N	0835522W	9740.826
Harris Chapel	Knox	church	355352N	0835422W	9784.23
(b) (6)	Knox	well-home	355403	835705	9823.758
K.M.C. Company	Knox	well-comm	355646	835606	9980.527
Woodlawn Christian Church	Knox	church	355615N	0835404W	10007.62
Harris Chapel Cemetery	Knox	cemetery	355350N	0835420W	10042.32
UT#2	Knox	well	355408	835714	10074.35
UT#1B	Knox	well	355409	835716	10146.34
I.C. King Park	Knox	park	355345N	0835646W	10152.38
UT#1C	Knox	well	355407	835715	10199.93
UT#1	Knox	well	355408	835716	10205.47
UT#1A	Knox	well	355408	835716	10205.47
UT#1D	Knox	well	355408	835716	10205.47
UT#2A	Knox	well	355408	835716	10205.47
UT#3	Knox	well	355408	835716	10205.47
UT#3A	Knox	well	355408	835716	10205.47
UT#3B	Knox	well	355408	835716	10205.47
UT#3D	Knox	well	355408	835716	10205.47
UT#3E	Knox	well	355408	835716	10205.47
UT#3F	Knox	well	355408	835716	10205.47
UT#3G	Knox	well	355408	835716	10205.47
UT#4	Knox	well	355408	835716	10205.47
UT#5	Knox	well	355408	835716	10205.47
UT#5A	Knox	well	355408	835716	10205.47
UT#6	Knox	well	355408	835716	10205.47
(b) (6)	Knox	well-home	355422	835727	10232.33
U T Department of Agriculture	Knox	school	355644N	0835624W	10257.67
UT#3C	Knox	well	355408	835717	10271.38
WSKT-AM (Knoxville)	Knox	tower	355442N	0835333W	10432.55
(b) (6)	Knox	well-home	355325	835518	10475.45
Graystone Presbyterian Church	Knox	church	355642N	0835436W	10496.82
Kerns Quarry	Knox	mine	355542N	0835334W	10524.87

TABLE 1 (continued)-USGS GNIS Query Results, 7.5'x7.5' Map:Knoxville, with TDEC/DWS 1997 wells added

FEATURES BETWEEN TWO AND THREE MILES DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Fort Dickerson Park	Knox	park	355653N	0835457W	10852.31
Cherokee Bluffs	Knox	cliff	355527N	0835748W	10964.53
Mooreland Heights	Knox	pop pl	355459N	0835322W	11025.69
Fire Station Number 28	Knox	building	355328N	0835440W	11068.03
Flenniken Branch	Knox	stream	355343N	0835704W	11204.86
Clinch Avenue Park	Knox	park	355702N	0835550W	11326.83
McCarrell Spring	Knox	spring	355435N	0835749W	11413.77
James E Karnes Bridge	Knox	bridge	355649N	0835644W	11423.4
Stokely Athletic Center	Knox	building	355704N	0835547W	11503.4
Crenshaw	Knox	pop pl	355318N	0835616W	11544.25
Timberlake	Knox	pop pl	355443N	0835756W	11761.5
McClung Museum	Knox	building	355707N	0835538W	11768.34
Maxey Dock	Knox	locale	355414N	0835744W	11836.28
Welwyn (historical)	Knox	pop pl	355340N	0835712W	11859.76
South Knoxville	Knox	pop pl	355635N	0835356W	11861.6
McCarrell Cemetery	Knox	cemetery	355426N	0835752W	11940.88
WUTK-FM (Knoxville)	Knox	tower	355709N	0835534W	11967.76
Methany Phil	Knox	well-home	355357	835339	11977.95
Southbrook	Knox	pop pl	355445N	0835312W	12040.2
Robertshaw-Fulton C	Knox	well-ind	355703	835627	12112.13
Robertshaw-Fulton C	Knox	well-other	355703	835627	12112.13
(b) (6)	Knox	well-home	355531	835310	12163.31
South Knoxville Quarry	Knox	mine	355705N	0835448W	12218.18
(b) (6)	Knox	well-home	355350	835341	12282.79
South Young High School	Knox	school	355623N	0835335W	12359.92
Sequoyah Hills Presbyterian Church	Knox	church	355602N	0835753W	12408.24
Screen Art Inc.	Knox	CERCLA	355648	835354	12935.49
Witherspoon Landfill	Knox	CERCLA	355648	835254	12935.49
Witherspoon, David Incorporated	Knox	CERCLA	355648	835354	12935.49
Shields-Wakins Field	Knox	park	355717N	0835529W	12777.3
(b) (6)	Knox	well-home	355305	835618	12835.55
Hodges Library	Knox	building	355718N	0835548W	12901.67
Colonial Village	Knox	pop pl	355510N	0835258W	12947.54
East TennesseeBaptist Hospital	Knox	hospital	355715N	0835454W	13027.8
Sequoyah Park	Knox	park	355539N	0835812W	13128.67
Tyson Junior High School	Knox	school	355709N	0835644W	13200.37
Fifth Avenue Baptist Church	Knox	church	355908N	0835349W	13353.71
(b) (6)	Knox	well-home	355453	835818	13370.47
Lake Hills Church	Knox	church	355446N	0835817W	13390.87
Chapman Highway Shopping Center	Knox	locale	355518N	0835252W	13468.75
Sevier Heights Baptist Church	Knox	church	355632N	0835325W	13555.09
(b) (6)	Knox	well-home	355304	835431	13555.54
(b) (6)	Knox	well-home	355420	835300	13685.34

TABLE 1 (continued)-USGS GNIS Query Results, 7.5'x7.5' Map:Knoxville, with TDEC/DWS 1997 wells added

FEATURES BETWEEN TWO AND THREE MILES DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Tyson Park	Knox	park	355715N	0835643W	13712.09
Henley Street Bridge	Knox	bridge	355724N	0835504W	13715.47
Calvary Baptist Church	Knox	church	355707N	0835702W	13716.04
Williams Shoals	Knox	bar	355338N	0835743W	13807.73
Fort SandersSchool	Knox	hospital	355725N	0835614W	13915.07
First United Methodist Church	Knox	church	355658N	0835724W	14016.85
Rock City Park	Knox	park	355700N	0835351W	14019.87
Tennessee Valley Unitarian Church	Knox	church	355705N	0835713W	14035.41
First Church of Christ Science	Knox	church	355655N	0835729W	14052.67
East Tennessee Childrens Hospital	Knox	hospital	355726N	0835612W	14088.75
Williams Island (historical)	Knox	island	355340N	0835751W	14182.66
Henson Spring Branch	Knox	stream	355358N	0835807W	14256.04
Hoskins Library	Knox	building	355732N	0835541W	14266.13
South Knox Elementary School	Knox	school	355724N	0835438W	14276.79
Southside Church	Knox	church	355333N	0835326W	14322.32
East Third Creek	Knox	stream	355718N	0835653W	14328.23
Church Street United Methodist Church	Knox	church	355733N	0835515W	14462.71
Knob Creek	Knox	stream	355319N	0835732W	14514.92
WIMZ-AM (Knoxville)	Knox	tower	355717N	0835704W	14660.49
Jones Cove	Knox	valley	355425N	0835827W	14683.34
Fort Sanders Baptist Church	Knox	church	355735N	0835602W	14714.47
Simpson School	Knox	school	355253N	0835647W	14757.45
New Salem Church	Knox	church	355307N	0835354W	14760.58
DeArmond Spring	Knox	spring	355258N	0835700W	14766.07
Atlantic Co	Knox	well	355737	835530	14767.04
Humes Ferry (historical)	Knox	crossing	355732N	0835447W	14814.75
First Baptist Church of Knoxville	Knox	church	355736N	0835505W	14877.61
Hillcrest United Methodist Church	Knox	church	355701N	0835335W	14935.03
Knoxville	Knox	pop pl	355738N	0835515W	14957.89
Bicentennial Park	Knox	park	355736N	0835449W	15156.62
DeArmond Spring Branch	Knox	stream	355303N	0835720W	15182.42
(b) (6)	Knox	pop pl	355300N	0835359W	15291.73
Bonny Kate Elementary School		school	355258N	0835355W	15296.53
East Tennessee Packing C	Knox	well-ind	355733	835431	15315.97
East Tennessee Packing C	Knox	well-ind	355733	835431	15315.97
East Tennessee Packing C	Knox	well-ind	355733	835431	15315.97
First Creek	Knox	stream	355737N	0835446W	15317.01
Knox County Courthouse	Knox	building	355740N	0835500W	15344.26
Stanles Knitting Mi	Knox	well	355743	835521	15406.3
Wells Cemetery	Knox	cemetery	355526N	0835843W	15417.02
Sequoyah Hills	Knox	pop pl	355610N	0835829W	15426.32
Knoxville City Expo Site	Knox	well	355744	835525	15483.17
Saint Johns Episcopal Church	Knox	church	355743N	0835507W	15539.96
Kingston Pike Shopping Center	Knox	locale	355626N	0835821W	15549.01
Gray Marble Co	Knox	well-ind	355732	835652	15560.83
Bartletts Fort (historical)	Blount	locale	355233N	0835647W	15678.84
Lyons Island	Knox	island	355455N	0835847W	15713.45
Emmanuel United Presbyterian Church	Knox	church	355920N	0835253W	15766.24

TABLE 1 (continued)-USGS GNIS Query Results, 7.5'x7.5' Map:Knoxville, with TDEC/DWS 1997 wells added

FEATURES BETWEEN THREE AND FOUR MILES DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Tipton Cemetery	Blount	cemetery	355231N	0835649W	15925.05
Lyons Shoals	Knox	bar	355450N	0835850W	16009.65
Conergy Marketi World Fair Site	Knox	well	355750	835535	16055.45
Stock Creek	Knox	stream	355231N	0835654W	16083.43
Lakemoor Hills	Knox	pop pl	355538N	0835850W	16158.04
Marble City Baptist Church	Knox	church	355713N	0835743W	16161.98
Dixie Laundry Compa	Knox	well-ind	355740	835421	16263.91
Doyle Middle School	Knox	school	355323N	0835305W	16273.93
University of Tennessee Experimental Farm	Knox	locale	355733N	0835710W	16295.42
Twin Creek	Knox	stream	355237N	0835356W	16360.58
Marble City	Knox	pop pl	355709N	0835753W	16408.26
Hotel Farragut	Knox	well-ind	355752	835505	16451.98
First Presbyterian Church	Knox	church	355751N	0835458W	16452.33
Hillvale Country Club	Knox	locale	355237N	0835719W	16485.08
Knoxville City Hall	Knox	building	355755N	0835524W	16583.03
Market Square	Knox	park	355755N	0835511W	16680.13
Fire Station Number 17	Knox	building	355417N	0835851W	16799.43
Doyle High School	Knox	school	355315N	0835305W	16803.07
Rudder Cemetery	Knox	cemetery	355412N	0835849W	16805.65
Interchange 386	Knox	crossing	355748N	0835645W	16833.76
Riverbend	Knox	pop pl	355343N	0835835W	16991.14
Summit Hill	Knox	summit	355759N	0835521W	16997.24
Peter Blow Bend	Knox	bend	355549N	0835858W	17026.53
Marble Springs	Knox	locale	355348N	0835233W	17032.86
(b) (6)	Knox	well-home	355452	835903	17046.91
Knoxville Civic Auditorium	Knox	building	355754N	0835441W	17060.21
Flint Hill	Knox	summit	355752N	0835431W	17105.11
Western Plaza Shopping Center	Knox	locale	355630N	0835841W	17177.32
Immaculate Conception Catholic Church	Knox	church	355801N	0835519W	17208.66
Cal Johnson Park	Knox	park	355800N	0835458W	17334.44
(b) (6)	Knox	well-home	355307	835808	17411.28
Old Water Mill	Knox	locale	355423N	0835901W	17413.58
McMillan School (historical)	Knox	school	355758N	0835440W	17466.59
Topside	Knox	pop pl	355233N	0835735W	17523.27
(b) (6)	Knox	well-home	355725	835320	17553.64
Mark James Park	Knox	park	355715N	0835306W	17577.31
Knott Cemetery	Knox	cemetery	355717N	0835804W	17607.15
Mount Pleasant Church	Knox	church	355608N	0835859W	17644.48
John Tarleton Institute	Knox	school	355727N	0835751W	17656.73
Coatney Hollow	Knox	valley	355253N	0835318W	17658.14
Interchange 387	Knox	crossing	355806N	0835545W	17666.19
Deaderick Avenue Baptist Church	Knox	church	355805N	0835603W	17689.98
Lyons View School (historical)	Knox	school	355608N	0835900W	17721.76

TABLE 1 (continued)-USGS GNIS Query Results, 7.5'x7.5' Map:Knoxville, with TDEC/DWS 1997 wells added

FEATURES BETWEEN THREE AND FOUR MILES DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Mockingbird Hill	Knox	pop pl	355401N	0835857W	17812.04
Leslie Street Park	Knox	park	355757N	0835654W	17931.14
Lyons Bend	Knox	bend	353305N	0835815W	17962.84
Island Home	Knox	pop pl	355721N	0835305W	18065.91
Knoxville Division	Knox	civil	355805N	0835633W	18161.95
Cherokee Golf and Country Club	Knox	locale	355600N	0835909W	18179.94
Maynard Elementary School	Knox	school	355808N	0835619W	18194.69
Washburn Street Church	Knox	church	355703N	0835831W	18299.72
Southern Station	Knox	locale	355812N	0835513W	18346.19
Baker Creek	Knox	stream	355736N	0835321W	18364.85
Temperance Hill	Knox	summit	355808N	0835442W	18390.52
WKGN-AM (Knoxville)	Knox	tower	355720N	0835814W	18392.55
Green Elementary School	Knox	school	355808N	0835440W	18430.64
Lakeshore Mental Health Institute	Knox	hospital	355528N	0835921W	18534.5
Knoxville College	Knox	school	355811N	0835631W	18700.62
Mount Olive Baptist Church	Knox	church	355426N	0835619W	18880.01
Beardsley Middle School	Knox	school	355808N	0835653W	18932.6
Williams Creek	Knox	stream	355746N	0835326W	18936.79
Causier School	Knox	school	355810N	0835646W	18939.21
Morningside Park	Knox	park	355807N	0835415W	18950.9
(b) (6)	Knox	well-home	355403	835913	18960.81
Island Home Baptist Church	Knox	church	355721N	0835247W	19106.4
Wallace Chapel African Methodist Episcopal Zion	Knox	church	355617N	0835914W	19107.55
Knox Plaza Shopping Center	Knox	locale	355623N	0835912W	19176.61
Interchange 385	Knox	crossing	355728N	0835818W	19192.73
Westminister Ridge	Knox	pop pl	355434N	0835927W	19248.15
Maynard Glen Park	Knox	park	355717N	0835240W	19259.51
Lyons View	Knox	pop pl	355539N	0835929W	19325.91
First Christian Church	Knox	church	355823N	0835522W	19380.05
Victory Temple Assembly of God Church	Knox	church	355824N	0835528W	19456.84
Old Gray Cemetery	Knox	cemetery	355825N	0835529W	19553.93
Forest Hills	Knox	pop pl	355633N	0835912W	19582
Saint Johns Lutheran Church	Knox	church	355826N	0835525W	19665.9
West View United Methodist Church	Knox	church	355743N	0835806W	19670.45
Belmont Heights Baptist Church	Knox	church	355806N	0835723W	19708.59
Baker Shoals	Knox	bar	355745N	0835308W	19725.37
(b) (6)	Knox	well-home	355458	835937	19778.95
Vine Junior High School	Knox	school	355820N	0835421W	20013.88
Central Church of God	Knox	church	355717N	0835845W	20069.64
Malcom Martin Park	Knox	park	355822N	0835647W	20106.5
Tennessee for Deaf School	Knox	school	355730N	0835240W	20142.1
National Cemetery	Knox	cemetery	355831N	0835536W	20143.84
Village Square Shopping Center	Knox	locale	355614N	0835929W	20163.24

TABLE 1 (continued)-USGS GNIS Query Results, 7.5'x7.5' Map:Knoxville, with TDEC/DWS 1997 wells added

FEATURES BETWEEN THREE AND FOUR MILES DISTANT FROM THE SITE

Feature Name	County	Type	Latitude	Longitude	Distance (feet)
Interchange 388	Knox	crossing	355830N	0835507W	20184.5
Lyons Mill (historical)	Knox	locale	355501N	0835944W	20337.76
Westminister Presbyterian Church	Knox	church	355457N	0835944W	20357.31
Pond Gap Elementary School	Knox	school	355706N	0835900W	20385.63
Beaumont Avenue Baptist Church	Knox	church	355826N	0835644W	20420.2
Mount Calvary Baptist Church	Knox	church	355820N	0835406W	20424.85
Mountain View School (historical)	Knox	school	355821N	0835404W	20577.35
Crestview Cemetery	Knox	cemetery	355801N	0835755W	20589.67
McMullen Quarry	Knox	mine	355756N	0835308W	20601.53
Mabrys Hill	Knox	summit	355822N	0835404W	20670.17
Central United Methodist Church	Knox	church	355836N	0835521W	20679.02
Bearden United Methodist Church	Knox	church	355616N	0835935W	20692.94
Marble Hill	Knox	summit	355753N	0835301W	20707.25
Beaumont Elementary School	Knox	school	355833N	0835628W	20784.76
Austin High School	Knox	school	355827N	0835416W	20804.76
(b) (6)	Knox	well	355357	835936	20936.23
Knox County Health Center	Knox	hospital	355839N	0835538W	20942.26
Virginia Avenue United Methodist Church	Knox	church	355823N	0835716W	21009.96
Badgett Drive Ldfl	Knox	CERCLA	355630	835906	21017.15
Church of the Ascension	Knox	church	355532N	0835951W	21021.22
Highland Memorial Cemetery	Knox	cemetery	355632N	0835932W	21035.59
Duncan Dock	Knox	locale	355317N	0835914W	21067.95
(b) (6)	Knox	well-home	355322	835918	21089.98

TABLE 1 (continued)-USGS GNIS Query Results, 7.5'x7.5' Map:Knoxville, with TDEC/DWS 1997 wells added

TABLE TWO

SCHOOLS NEAR THE SMOKEY MOUNTAIN SMELTER SITE

Vestal School (closed)	Knox	school	355537N	0835538W	2797.022
Mount Olive Elementary School	Knox	school	355425N	0835625W	5947.671
Young High School (closed)	Knox	school	355600N	0835421W	7977.245
Mooreland Heights Elementary School	Knox	school	355507N	0835358W	8032.988
Flenniken Elementary School (closed)	Knox	school	355623N	0835444W	8521.316
U T Department of Agriculture	Knox	school	355644N	0835624W	10257.67
Doyle Middle School (formerly South Young High School)	Knox	school	355623N	0835335W	12359.92
University of Tennessee	Knox	school	355715N	0835551W	12624.95
Dogwood Elementary School (formerly South Junior High School)	Knox	school	355647N	0835356W	12753.63
Tyson Junior High School (closed)	Knox	school	355709N	0835644W	13200.37
South Knox Elementary School	Knox	school	355724N	0835438W	14276.79
Simpson School (closed)	Knox	school	355253N	0835647W	14757.45
Bonny Kate Elementary School	Knox	school	355258N	0835355W	15296.53
South Doyle Middle School (formerly Doyle Middle School)	Knox	school	355323N	0835305W	16273.93
South Doyle High School (formerly Doyle High School)	Knox	school	355315N	0835305W	16803.07
McMillan School (historical)	Knox	school	355758N	0835440W	17466.59
John Tarleton Institute (orphanage)	Knox	school	355727N	0835751W	17656.73
Lyons View School (historical)	Knox	school	355608N	0835900W	17721.76
Maynard Elementary School	Knox	school	355808N	0835619W	18194.69
Green Elementary School	Knox	school	355808N	0835440W	18430.64
Knoxville College	Knox	school	355811N	0835631W	18700.62
Beardsley Middle School (closed)	Knox	school	355808N	0835653W	18932.6
Causier School (?)	Knox	school	355810N	0835646W	18939.21
Vine Middle School (formerly Vine Junior High School)	Knox	school	355820N	0835421W	20013.88
Tennessee for Deaf School	Knox	school	355730N	0835240W	20142.1
Pond Gap Elementary School	Knox	school	355706N	0835900W	20385.63
Mountain View School (historical)	Knox	school	355821N	0835404W	20577.35
Beaumont Elementary School	Knox	school	355833N	0835628W	20784.76
Vine Middle School (formerly Austin High School)	Knox	school	355827N	0835416W	20804.76
Rule High School (closed)	Knox	school	355829N	0835712W	21439.75
Bearden Middle School	Knox	school	355608N	0835950W	21629.38
Knoxville Catholic High School (closed)	Knox	school	355842N	0835428W	21959.52
Bearden Elementary School	Knox	school	355606N	0835955W	21971.49
Eastport Elementary School (closed)	Knox	school	355831N	0835348W	22002.18
Creswell School (historical)	Knox	school	UNKNOWN	UNKNOWN	UNKNOWN
East Tennessee Female Institute (historical)	Knox	school	UNKNOWN	UNKNOWN	UNKNOWN
Hampden Sidney Academy (historical)	Knox	school	UNKNOWN	UNKNOWN	UNKNOWN
Knoxvile Female Academy (historical)	Knox	school	UNKNOWN	UNKNOWN	UNKNOWN
Knoxville Literary Presbyterian Church (?)	Knox	school	UNKNOWN	UNKNOWN	UNKNOWN
Slater Training Academy and Industrial	Knox	school	UNKNOWN	UNKNOWN	UNKNOWN

updated 12-97 according to information provided by Ms. Sharon Jenkins, Knox County Scool System

REFERENCE

" Home and unspecified-use wells within a four miles radius of Smokey Mountain Smelters "

Maupin, B.H. (TDEC/DSF). 1997e. "Home and unspecified-use wells within a four miles radius of Smokey Mountain Smelters". December.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

TABLE ONE - HOME AND UNSPECIFIED-USE WELLS NEAR SMOKEY MOUNTAIN SMELTERS

Owner's name[1]	Co[1]	Use[1]	Latitude[1]	Longitude[1]	Distance (feet)
(b) (6)	Knox	home	355509	835545	737.496
	Knox	home	355524	835524	1790.095
	Knox	home	355518	835602	2311.865
	Knox	home	355509	835506	2458.32
	Knox	home	355440	835545	2984.494
	Knox	home	355533	835605	3372.711
	Knox	home	355425	835550	4535.263
	Knox	home	355456	835438	4926.385
	Knox	home	355449	835646	6072.924
	Knox	home	355449	835646	6072.924
	Knox	home	355408	835510	6445.356
	Knox	home	355442	835421	6709.723
	Knox	home	355425	835430	6964.356
	Knox	home	355426	835423	7360.069
	Knox	home	355404	835619	7377.745
	Knox	home	355420	835422	7787.621
	Knox	home	355410	835430	7991.65
	Knox	home	355408	835430	8139.604
	Knox	home	355533	835715	8458.13
Clark Home Builders	Knox	home	355343	835545	8607.744
(b) (6)	Knox	home	355500	835730	9384.631
	Knox	home	355403	835705	9823.758
	Knox	home	355422	835727	10232.33
	Knox	home	355325	835518	10475.45
	Knox	home	355357	835339	11977.95
	Knox	home	355531	835310	12163.31
	Knox	home	355350	835341	12282.79
	Knox	home	355305	835618	12835.55
	Knox	home	355453	835818	13370.47
	Knox	home	355304	835431	13555.54
	Knox	home	355420	835300	13685.34
	Knox	home	355737	835530	14767.04
	Knox	home	355452	835903	17046.91
	Knox	home	355307	835808	17411.28
	Knox	home	355725	835320	17553.64
	Knox	home	355403	835913	18960.81
	Knox	home	355458	835937	19778.95
	Knox	home	355322	835918	21089.98
	Knox	home	355727	835902	21779.18
	Knox	home	355337	835952	22896.12
	Knox		355522	835615	3448.747
	Knox		355521	835616	3489.372
	Knox		355358	835555	7249.425
UT#2	Knox		355408	835714	10074.35
UT#1B	Knox		355409	835716	10146.34
UT#1C	Knox		355407	835715	10199.93
UT#1	Knox		355408	835716	10205.47
UT#1A	Knox		355408	835716	10205.47
UT#1D	Knox		355408	835716	10205.47
UT#2A	Knox		355408	835716	10205.47
UT#3	Knox		355408	835716	10205.47
UT#3A	Knox		355408	835716	10205.47
UT#3B	Knox		355408	835716	10205.47
UT#3D	Knox		355408	835716	10205.47
UT#3E	Knox		355408	835716	10205.47
UT#3F	Knox		355408	835716	10205.47
UT#3G	Knox		355408	835716	10205.47
UT#4	Knox		355408	835716	10205.47
UT#5	Knox		355408	835716	10205.47
UT#5A	Knox		355408	835716	10205.47
UT#6	Knox		355408	835716	10205.47
UT#3C	Knox		355408	835717	10271.38
(b) (6)	Knox		355357	835936	20936.23

[1]Data from TDEC/DWS 1997.

" Site Identification ("Discovery") "

Maupin, B.H. (TDEC/DSF). 1997~~c~~f. Potential Hazardous Waste Site - Site Identification ("Discovery") August 6.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

FILE COPY

POTENTIAL HAZARDOUS WASTE SITE
SITE IDENTIFICATION ("DISCOVERY")

I. IDENTIFICATION

01 ST	02 SITE NUMBER TDSF#47-559
TN	TND098071061

II. SITE NAME AND LOCATION

01 SITE NAME *(Legal, common, or descriptive name of site)*	02 STREET, ROUTE NUMBER, OR SPECIFIC LOCATION IDENTIFIER				
SMOKEY MOUNTAIN SMELTERS	1508 MARYVILLE PIKE				
03 CITY	**04 ST**	**05 ZIP CODE**	**06 COUNTY**	**07 CO CODE**	**08 CONG DIST**
KNOXVILLE	TN	37920	KNOX	47	2

09 DIRECTIONS TO SITE *(Starting from nearest public road; enter up to 4 lines of text)*

The Site is easily visible and accessible from Maryville Pike, State Secondary Route #33, just outside the Knoxville City limits. From southbound Route #33, turn left onto Caleb Avenue before crossing a bridge over railroad tracks; the entrance to the Site is immediately on the right, at Caleb Avenue. LATITUDE: 35° 55' 09" LONGITUDE: 83° 55' 36" PPE at mile 1.2 of unnamed tributary of Flenniken Branch at mile 0.4.

III. RESPONSIBLE PARTIES

01 OWNER *(If known)*	02 STREET *(Business, residential, mailing)*		
Daniel E. Johnson	P O Box 2704		
03 CITY	**04 ST**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**
Knoxville	TN	37901	
07 OWNER *(additional address)*	**08 STREET** *(Business, residential, mailing)*		
Daniel E. Johnson	912 S. Gay Street, Suite 1600		
09 CITY	**10 ST**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**
Knoxville	TN	37902	

13 TYPE OF OWNERSHIP *(Mark one; use "insert" mode)*

x A. PRIVATE　_ B. FEDERAL *(Agency name)*: ________　_ C. STATE　_ D. COUNTY
_ E. MUNICIPAL　_ F. OTHER *(Specify)*: ________　_ G. UNKNOWN

IV. HOW IDENTIFIED

01 DATE IDENTIFIED: June 25, 1995 *(Month/Day/Year)*

02 IDENTIFIED BY *(Mark all that apply; use "insert" mode)*

_ A. CITIZEN COMPLAINT　_ B. INDUSTRY　X C. STATE/LOCAL GOVERNMENT
_ D. AERIAL RECONNAISSANCE　_ E. RCRA INSPECTION　_ F. SURFACE IMPOUNDMENT ASSESSMENT
_ G. OTHER EPA IDENTIFICATION　X H. OTHER *(Specify)*: landfill shown on property map

V. SITE CHARACTERIZATION

01 TYPE OF SITE *(Mark all that apply; use "insert" mode)*

_ A. STORAGE　_ B. TREATMENT　x C. DISPOSAL　x D. UNAUTHORIZED DUMPING　_ E. OTHER *(Specify)*: ________

02 SUMMARY OF KNOWN PROBLEMS *(Provide narrative description; enter up to 6 lines of text)*

An unpermitted industrial landfill exists at this facility.

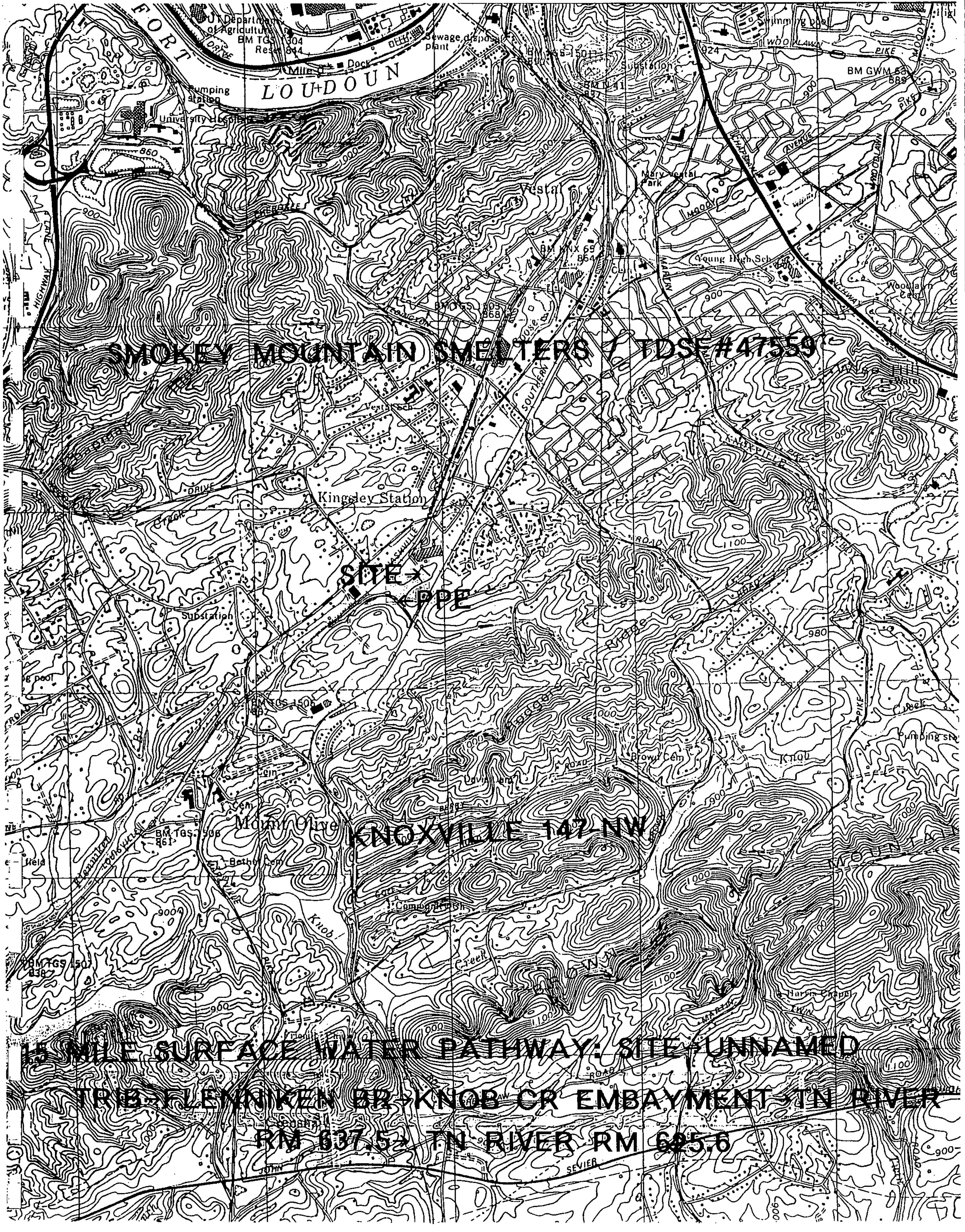
03 SUMMARY OF ALLEGED OR POTENTIAL PROBLEMS *(Provide narrative description; enter up to 5 lines of text)*

Unknown wastes and containment.

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF *(Agency/Organization)*			03 TELEPHONE NUMBER
04 PREPARED BY	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE** *(Month/Day/Year)*
Burl H. Maupin	TDSF	TDEC	423/594-5479	August 6, 1997

EPA FORM 2070-11 (07/81); Revised by EPA/Rgn 3/SAS/KJW (09/94)



SMOKEY MOUNTAIN SMELTERS / TDSF#47559
SITE →
← PPE
KNOXVILLE 147-NW
15 MILE SURFACE WATER PATHWAY: SITE→UNNAMED TRIB→LENNIKEN BR→KNOB CR EMBAYMENT→TN RIVER RM 637.5→ TN RIVER RM 625.6
FORT LOUDOUN
Sewage disposal plant
Pumping station
University Hospital
Vestal
Mary Vestal Park
Young High Sch
Vestal Sch
Kingsley Station
Substation
Mount Olive
Brown Cem
Harris Chapel
Woodlawn Cem

" WHPA near SMS "

Maupin, B.H. 1997 "WHPA near SMS", memo to Files (DSF), dated November 21.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

M E M O R A N D U M

DATE: December 21, 1997

TO: Files

FROM: BHM

RE: WHPA near SMS

The absence of WHPA's within a four mile radius of Smokey Mountain Smelters was recently discussed with Mr. Steve Roberts, Knoxville Field Office Manager of the Division of Water Supply. The nearest WHPA is beyond RM 633 of the Tennessee River, which is at least five miles distant from the Site.

"Ground-Water Resources of East Tennessee"

TDC/Division of Geology. 1956. "Ground-Water Resources of East Tennessee". State of Tennessee, Department of Conservation, Division of Geology. Bulletin 58, Part 1, pp. 6-9, 12, 43-4, 245-68, Plate 9 (See Figure 5, "GEOLOGIC MAP").

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

State of Tennessee

DEPARTMENT OF CONSERVATION

DIVISION OF GEOLOGY

BULLETIN 58

PART I

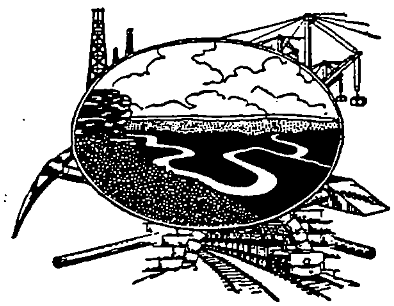
GROUND-WATER RESOURCES OF EAST TENNESSEE

By

G. D. DeBUCHANANNE

and

R. M. RICHARDSON



Prepared in cooperation with the U. S. Geological Survey

NASHVILLE, TENNESSEE

1956

GEOGRAPHY

Physiographic Divisions

East Tennessee lies within the boundaries of three great physiographic divisions. These divisions, as defined by Fenneman (1938), are the Blue Ridge province, the Valley and Ridge province, and the Appalachian Plateau province.

Blue Ridge Province

The Blue Ridge province is a belt of mountains which extends from Georgia to the Susquehanna River in Pennsylvania. North of the Roanoke River in Virginia this belt of mountains does not exceed 12 to 14 miles in width, whereas south of the Roanoke River it broadens to a maximum width of 70 miles and increases in elevation. In East Tennessee, a portion of this province extends from Virginia to Georgia, forming a belt of mountains along the North Carolina border. Collectively, the mountains are known as the Unakas. The elevation of these mountains in Tennessee ranges from 1,200 to more than 6,600 feet. The mountains are generally mantled with decayed rocks; bare slopes and talus are rare. Steep slopes of bare rocks are generally restricted to deepened river gorges rather than sharp divides.

Valley and Ridge Province

The Valley and Ridge province is a long, narrow belt of faulted and folded dominantly calcareous Paleozoic rocks. It extends for 1,200 miles from the St. Lawrence Valley to the Gulf Coastal Plain in Alabama. In Tennessee its average width is about 40 miles.

The average elevation of this province in East Tennessee is about 1,000 feet. Elevations range from a 700-foot average in Hamilton County in the south to a 1,500-foot average in Sullivan County in the north. This province, lying between the Blue Ridge province on the east and the Appalachian Plateau province on the west, is characterized by a succession of northeast trending ridges of various widths. The ridges are held up by the less soluble cherty limestone and dolomite and sandy shale, whereas the valleys are developed in the more soluble limestone, dolomite, and shale. Folding and thrusting cause nearly all the beds to dip southeast.

Appalachian Plateau Province

The Appalachian Plateau province, lying just west of the Valley and Ridge province, is a low chain of folded mountains extending from the St. Lawrence River to the Gulf Coastal Plain in Alabama. In Tennessee this province is represented by the Cumberland Plateau.

That part of the Cumberland Plateau known as the Cumberland Mountains rises higher than adjacent areas. Elevations range from 2,000 to 3,500 feet but those from 2,500 to 3,000 feet are most common. The rocks of the Cumberland Plateau consist of sandstone, shale, conglomerate, and coal. They are essentially flat lying, except at the contact with the Valley and Ridge province where the formations are almost vertical.

Climate

East Tennessee does not lie directly within any of the principal storm tracks that cross the country. The area is influenced primarily by storms that pass along the Gulf Coast and thence up the Atlantic Coast, and to a lesser extent by those that pass northeastward from Oklahoma to Maine. Weather changes are frequent as compared with the stable conditions of the far Southwest, but not as frequent as in the Great Lakes region or the northeastern States (U. S. Dept. Agr., 1941).

Temperature

The difference in elevation between mountain top and valley in East Tennessee causes a considerable variation in temperature. The mean annual temperature of East Tennessee, based upon records from Chattanooga, Knoxville, and Bristol, is between 57° and 58° F. Temperature extremes of –32°F. in Johnson County and 111°F. in Blount County have been recorded. July is the hottest month and January is the coldest. The usual date of the last killing frost ranges from March 30 in Hamilton County to May 10 in Johnson and Carter Counties. The usual date of the first killing frost ranges from October 5 in Johnson and Carter Counties to October 30 in Hamilton County. The growing season varies from 150 to 210 days, depending upon latitude and elevation.

Average monthly temperatures for Chattanooga, Knoxville, and Bristol taken from Weather Bureau records (U. S. Dept. Comm., 1950) are shown in the following table:

TABLE 1.—AVERAGE MONTHLY TEMPERATURES (°F.)

	Chattanooga Airport Station (1937–50)	Knoxville Airport Station (1937–50)	Bristol Airport Station (1938–50)
January	39.1	37.6	38.9
February	42.2	40.9	42.2
March	49.1	47.5	47.4
April	57.6	57.3	57.4
May	65.5	66.7	64.9
June	72.2	73.8	73.0
July	77.4	76.7	76.4
August	75.7	75.4	75.1
September	68.2	69.4	71.3
October	57.7	58.5	58.6
November	47.9	47.5	47.4
December	40.9	39.1	40.6
Average	57.8	57.5	57.8

PRECIPITATION

Precipitation in East Tennessee is controlled in part by topography. It is heavier on the Cumberland Plateau and in the Unaka Mountains than in the Valley and Ridge province. Moist air masses reach the Valley and Ridge province comparatively dry because, in passing over the mountain on either side, their moisture is condensed and precipitated. Parts of the Cumberland Plateau receive an average annual precipitation of about 55 inches, whereas in upper East Tennessee the average is about 44 inches. The amount of precipitation increases rapidly up the slopes of the Unaka Mountains. Precipitation in excess of 80 inches has been recorded on some of the mountain tops along the Tennessee-North Carolina boundary.

The valley-wide average precipitation above Hales Bar dam, which is on the Tennessee River a short distance downstream from Chattanooga, is 50.85 inches (TVA, 1950). The highest annual precipitation occurs in the mountainous area in the southeastern portion of the State along the Tennessee-North Carolina border. The lowest annual precipitation occurs in portions of Greene, Washington, and Unicoi Counties.

Rainfall is well distributed throughout the year. The wettest months are January, February, and March and the driest are September, October, and November. A quantity of water sufficient for crops generally falls during the growing season and a sufficient supply is available for ground-water recharge during the winter months. The following table gives the average monthly precipitation at Chattanooga, Knoxville and

TABLE 2.—AVERAGE MONTHLY PRECIPITATION (INCHES)

	Chattanooga Airport Station (1937–50)	Knoxville Airport Station (1937–50)	Bristol Airport Station (1938–50)
January	5.26	4.66	3.65
February	4.88	4.51	3.80
March	5.78	5.05	3.81
April	4.85	4.14	3.47
May	3.77	3.75	4.09
June	4.16	4.10	3.83
July	4.25	3.36	5.10
August	4.03	3.92	3.29
September	3.11	2.68	2.72
October	3.01	2.62	2.62
November	3.36	3.07	2.45
December	5.13	4.52	3.96
Total	51.59	46.38	42.79

Mineral Resources

Many deposits of metallic and nonmetallic minerals of economic importance occur in East Tennessee. In decreasing order of dollar value, the important minerals are: coal, crushed stone, zinc, copper, marble, lime, iron, barite, and manganese. The relative standings of Tennessee mining districts, as compared with those in other states during 1952 are shown in the table below.

TABLE 3.—MINERAL PRODUCTION OF TENNESSEE FOR 1952 COMPARED WITH THAT OF OTHER STATES

Commodity	Production in short tons	Relative standing in production by States
Coal	5,265,000	10th
Zinc	38,020	8th
Copper	7,638	7th
Marble		
Crushed	15,381	2nd
Dimension	42,940	1st
Barite	14,000*	3rd (?)
Manganese	126	8th

*Estimated.

TABLE 4.—GEOLOGIC FORMATIONS IN EAST TENNESSEE—Continued

Era or system	Series	Group	Subdivisions	Thickness (feet)	Physical character	Water-bearing properties
Ordovician	Upper Ordovician		Sequatchie formation / Juniata formation	200-400	Sequatchie: Maroon and blue shaly limestone and shale. Juniata: Maroon siltstone and shale.	Yield small supplies to wells and springs.
	Middle Ordovician		Upper part of Chickamauga limestone: Reedsville shale; Chickamauga limestone Unit 4; Martinsburg shale	700-1,000	Upper part of Chickamauga: Blue, crystalline well-bedded limestone; upper part shaly limestone. Reedsville shale: Bluish calcareous shale. Martinsburg shale: Bluish calcareous shale.	Limestones yield small to moderate quantities of water to wells and springs. Where limestones are interbedded in shale, the limestone commonly contains well-developed solution cavities. Quality of water varies. Shale generally yields larger quantities of water to drilled wells than limestone. Quality of water varies.
			Lower and middle parts of Chickamauga limestone: Unit 3: Moccasin formation / Bays formation	700-1,000	Moccasin: Maroon limy shale and shaly limestone and blue flaggy limestone. Bays: Maroon siltstone and shale.	
			Lower and middle parts of Chickamauga limestone: Unit 2: Ottosee shale; Unit 1: Holston formation, Lenoir limestone / Athens shale; Sevier shale	2,500-4,000	Units of Chickamauga limestone: Blue generally well-bedded limestone, in part silty and shaly. Ottosee: Bluish calcareous shale containing crystalline limestone lenses. Holston: Red crystalline limestone (marble), quartzose crystalline limestone and limy sandstone. Lenoir: Blue nodular and massive limestone. Sevier: Blue calcareous shale with sandstone beds, blue limestone at base. Athens: Bluish calcareous shale and shaly limestone, blue limestone at base, some sandstone.	
	Lower Ordovician	Knox	Newala, Longview and Chepultepec formations undivided: Newala formation: Mascot dolomite; Jonesboro limestone	400-800	Siliceous dolomite (Jonesboro limestone: Dark, blue weathering limestone)	Water occurs in joints and solution channels. Yield small to large supplies to wells. Water generally of good quality. Sandstone beds in Chepultepec dolomite serve as aquifers for small supplies. Numerous large springs are found in these rocks.
			Newala formation: Kingsport formation	200	Siliceous dolomite, thick limestone near base.	
			Longview dolomite	250	Very siliceous dolomite, limestone beds near top.	
			Chepultepec dolomite	700-750	Siliceous dolomite, sandstone beds near base.	

	Copper Ridge dolomite / Conococheague limestone	000-1,100	Copper Ridge: Dark crystalline siliceous dolomite. Conococheague: Limestone.

other than calcium and magnesium is usually low enough not to cause any difficulty in the use of the water.

The Athens shale is about 800 to 1,000 feet thick. It is in part shaly, nodular limestone and in part bluish, yellow-weathering calcareous shale. It weathers to produce a thin acid soil containing many shale chips.

Analysis of depths of wells in Athens shale indicates that the formation behaves hydrologically as a shale rather than a limestone. In East Tennessee, calcareous shales with interbedded limestones are generally good aquifers. The solubility of both the calcareous shale and the limestone tends to make such formations quite permeable. Three springs scheduled in the Athens had yields of more than 450 gpm. Most wells produce at least domestic quantities of water.

Samples of water from 10 sources in this formation were analyzed. The hardness ranged from 46 to 404 ppm and averaged 210 ppm.

Holston formation

The Holston formation ranges in thickness from 200 to 500 feet and contains several different types of rock, including reddish-colored limestone and limy sandstone. The upper members are usually coarsely crystalline and contain quartz sand, whereas the lower portion is thinly bedded and contains more limy shale. In places, members of this formation may contain as much as 50 percent quartz sand. Fossils in the limestone indicate that parts of this formation were formed as reefs. The Holston formation weathers very deeply, producing a dark-red residuum. The members that have a high quartz content form a deep sandy soil with chips and blocks of ferruginous sandstone from which the calcium carbonate has been leached. This formation generally forms knobby red-colored hills.

Water in this formation is restricted to fractures. No large springs were scheduled, but one estimated to yield more than 100 gpm was recorded. The yield of wells drilled in the Holston formation is dependent upon the size and number of fractures intercepted. No large industrial water supply is known to be obtained from this formation, but it furnishes many domestic supplies.

Analyses of water from this formation indicate hardness of less than 150 ppm. The water is generally of good quality.

Ottosee shale

The Ottosee shale consists of about 1,000 feet of blue, yellow-weathering carbonate shale and shaly siltstone with lenses of massive crystalline limestone that becomes thin bedded at the edges. In the northwestern belt of rocks the Ottosee shale consists of a shaly nodular limestone, whereas in the southeastern belts the Ottosee is predominantly shale containing limestone lenses. The soil overlying the Ottosee shale is rather thin and acid, except where limestone weathers to a thicker clay soil. In soil overlying the shaly phases of these rocks, chips of shale can be found. In locations underlain by limestones the soil is somewhat deeper and more fertile.

Ground water occurs in fractures in the limestone. Springs are common in the outcrop areas of these rocks. Of 24 springs scheduled, 5 were estimated to have yields of more than 450 gpm, and 11 were estimated to have yields of less than 10 gpm. The relatively pure limestone lenses in the shaly phase of the Ottosee shale may contain well-developed solution channels. The carbonate shale of the Ottosee shale also has been subjected to solution and is frequently water bearing. Of 129 wells scheduled in the Ottosee shale, 70 wells yielded at least a domestic supply of water within 100 feet. This indicates that, though the weathered Ottosee shale resembles a shale, the unweathered portion of the rock hydrologically resembles a limestone. No industrial or municipal wells are known to have been drilled in the Ottosee shale.

In chemical quality, water from the Ottosee shale resembles that from limestone formations more closely than water from shale formations. Water from the Ottosee can be expected to have a hardness of more than 100 ppm.

Sevier shale

The Sevier shale and its equivalents range in thickness from 2,500 to 4,000 feet and consist largely of blue, yellow-weathering silty to sandy calcareous shale. Locally, beds of blue shaly, nodular limestone; black carbonaceous, slightly calcareous fissile shale; blue or gray, brown-weathering sandstone; and conglomerate are found. These different rock types represent the changes in facies shown on figure 4 opposite page 66 of part II of this report. The Sevier shale usually forms rough, knobby, intricately dissected topography known locally as "slate knobs." Sandstone underlies the knobs, whereas shale free of sandstone frequently forms very flat ground. The soil is thin and full of shale chips.

Ground water in the Sevier shale is restricted to fractures. The formation has been shattered by past earth movements, making the shale rather permeable and therefore one of the better aquifers in East Tennessee. As the shale is calcareous, the fractures have been enlarged by solution to such an extent that numerous wells yield more than 150 gpm. About 50 percent of the wells scheduled in the Sevier shale obtained at least a domestic supply of water within the first 50 feet of drilling. As figures on yields are available for only a part of the wells in the Sevier shale, no conclusion can be drawn as to increase in yield with depth. Examination of cuttings from wells in the Sevier shale indicates that, though fractures are present at depth, they are usually sealed by calcium carbonate deposited from circulating ground waters.

Knox County

(Area 511 square miles, population 223,007)

General Features

Knox County lies in the central part of the region covered by this report. The county is irregular in shape and is bounded by Roane, Anderson, Union, Grainger, Jefferson, Sevier, Blount, and Loudon Counties.

Knoxville, the county seat, has a population of 124,769 and is the second largest city in East Tennessee; it is about 115 miles northeast of Chattanooga. Byington, Concord, Corryton, Heiskell, Kimberlin Heights, Fountain City, Mascot, Neubert, and Powell Station are smaller communities in the county.

The county has excellent facilities for transportation. A main line and a branch line of the Southern Railway System and a main line of the Louisville & Nashville Railroad provide rail transportation to many parts of the county. The Smoky Mountain Railway connects Knoxville with the area west of the Smoky Mountains. Numerous paved roads, U. S. Highways 70, 11E, 11W, 25W, 129, and paved State Highways 71, 9, and 33 cross the county. These roads, with the many good county roads, give access to all parts of the county. Knoxville is served also by three major airlines—American Airlines, Capital Airlines, and Delta Airlines.

Knox County is largely industrial. Its industries include marble, lumber, textile and clothing, temperature controls, chemicals, and many others. Many inhabitants of the county work in large plants in nearby counties, such as the aluminum plant at Alcoa and the large Atomic Energy Commission installation at Oak Ridge.

Geology

All of Knox County lies in the Valley and Ridge physiographic province. The topography, which is typical of this province, consists of alternating ridges and valleys cut into the steeply dipping, folded and faulted calcareous rocks. The rocks include limestone, dolomite, marble, calcareous shale, sandstone, and sandy shale.

The oldest rocks exposed are those of the Rome formation of Early Cambrian age. These clastic rocks include variegated sandstone and shale.

Overlying the Rome formation is a thick sequence of limestone, dolomite, and calcareous shale, ranging in age from Middle Cambrian to Middle Ordovician. The youngest rocks exposed are those of the Clinch sandstone of Early and Middle Silurian age atop House Mountain in the northern part of the county. Immediately underlying the

Clinch sandstone is the Juniata formation of Late Ordovician age, consisting of maroon siltstone and shale. Underlying the Juniata formation is the calcareous Martinsburg shale of Middle and Late Ordovician age.

Several belts of the Holston formation, a red crystalline limestone of Middle Ordovician age that is quarried for marble, strike northeast across the county.

Ground Water

The occurrence of ground water in Knox County is controlled by fractures in the underlying rocks. The rocks have little primary porosity, but fracturing, due to folding and faulting, has developed a secondary porosity. In carbonate rocks, solution by percolating ground water frequently enlarges fractures to a depth of about 300 feet. Below this depth the fractures are small, and frequently have been sealed with secondary calcite.

There are three municipal water supplies in Knox County. Knoxville obtains its water supply from Fort Loudon reservoir on the Tennessee River. Fountain City uses four springs for part of its supply. Powell Station is supplied by one spring. Several industries have wells with large yields. It is estimated that the amount of ground water used in the Knoxville area exceeds 10 million gallons per day.

Most industrial wells that have yields greater than 200 gpm are located near some permanent body of water. That many of these wells have a more or less direct connection with the surface water is indicated by fluctuations in the temperature of the well water that coincide with fluctuations in the temperature of the river water.

Large springs which yield up to several thousand gallons per minute are common in Knox County. Most of these springs are in areas underlain by limestone and dolomite.

TABLE 48.—DISCHARGE MEASUREMENTS OF SELECTED SPRINGS IN KNOX COUNTY

Spring	Location	Date of measurement	Discharge (gpm)	Temperature (°F.)		Remarks
				Air	Water	
Carter Mill (no. 199–S)	3½ Miles southwest of Strawberry Plains	5/ 9/31	1,230	60	58	Clear
		7/11/31	620	84	59	Milky
		10/22/31	1,140	60	57	Clear
		6/22/50	2,110	76	59	Muddy
		7/11/50	1,275	84	59	......
		8/ 1/50	1,297	85	59	Clear
		9/21/50	1,010	70	59	......
		10/11/50	925	70	59	......
		11/14/50	817	61	58	Clear
		12/19/50	938	32	58	Do.
		1/15/51	2,652	44	58	Muddy
		2/13/51	1,831	65	58	Clear
		3/21/51	2,329	52	58	Do.
		4/18/51	2,998	60	59	Do.
		5/16/51	1,638	72	58	Do.
		6/13/51	1,167	76	59	......
Boiling (no. 201–S)	4 miles south of Strawberry Plains	5/ 9/31	5,800	64	58	Muddy
		7/11/31	1,700	85	61	Do.
		10/22/31	885	60	59	Murky
		6/21/50	3,379	75	59	Muddy
		7/11/50	2,863	82	59	Do.
		8/ 1/50	5,924	87	61	Do.
		9/21/50	2,154	72	59	......
		10/11/50	1,705	70	59	......
		11/14/50	1,418	54	58	Muddy
		12/19/50	2,329	31	57	Do.
		1/15/51	9,515	45	53	Do.
		2/13/51	5,341	60	56	Do.
		3/21/51	9,470	55	56	Do.
		4/18/51	9,380	61	57	Milky
		5/16/51	4,712	78	58	Do.
		6/13/51	5,879	76	58	......
Deep	3 miles northwest of Fountain City	5/11/31	1,590	61	59	Clear
		7/13/31	556	81	59	Milky
		10/28/31	413	64	57	Clear
Seven	10 miles east of Concord	5/14/31	911	74	58	Clear
		7/ 3/31	700	91	59	Do.
		10/13/31	431	75	59	Do.
Maxwell (no. 58–S)	4 miles southwest of Bearden	6/16/50	682	83	58	Clear
		6/19/50	767	83	59	Murky
		7/12/50	579	78	58	Clear
		8/ 1/50	799	88	59	Milky
		9/14/50	512	79	60	......
		10/11/50	408	62	59	Clear
		11/13/50	312	62	59	Do.
		12/20/50	732	40	58	Do.
		1/16/51	884	39	58	Milky
		2/20/51	1,073	72	58	Do.
		3/20/51	1,122	50	58	Clear
		4/19/51	1,153	58	58	Do.
		5/15/51	826	81	57	Do.
		6/11/51	565	73	58	Do.

TABLE 48.–DISCHARGE MEASUREMENTS OF SELECTED SPRINGS IN KNOX COUNTY–Continued

Spring	Location	Date of measurement	Discharge (gpm)	Temperature (°F.) Air	Temperature (°F.) Water	Remarks
Huffaker (no. 187–S)	5½ miles south of Mascot	6/21/50	1,710	72	60	Muddy
		7/11/50	68	88	58	Clear
		8/10/50	255	78	59	Do.
		9/18/50	151	83	59	Do.
		10/11/50	96	72	59	Do.
		11/14/50	105	58	56	Do.
		12/20/50	129	35	58	......
		1/15/51	1,355	43	58	Muddy
		2/13/51	423	55	58	Clear
		3/21/51	507	54	58	......
		4/18/51	781	60	58	Clear
		5/16/51	344	78	58	Do.
		6/13/51	206	76	59	......
Cardwell (no. 225–S)	4 miles southwest of Corryton	6/20/50	434	88	61	Milky
		7/11/50	288	83	60	......
		8/15/50	274	75	61	Clear
		9/12/50	226	76	60	Milky
		10/23/50	147	74	59	Clear
		11/22/50	237	42	58	......
		12/18/50	437	30	55	......
		1/16/51	853	44	56	Muddy
		2/26/51	875	67	58	Milky
		3/19/51	934	39	57	Do.
		4/12/51	1,001	49	57	......
		5/15/51	525	82	58	......
		6/11/51	485	77	59	Cloudy
Hobbs (no. 247–S)	6 miles north of Fountain City	6/20/50	234	88	59	Clear
		7/11/50	146	79	59	......
		8/20/50	188	79	59	Clear
		9/12/50	134	80	59	Do.
		10/23/50	229	78	59	......
		11/22/50	241	43	58	......
		12/18/50	196	32	58	Clear
		1/16/51	399	41	57	Do.
		2/26/51	369	72	57	Do.
		3/19/51	444	39	56	......
		4/12/51	407	51	57	......
		5/15/51	399	83	57	......
		6/11/51	193	77	58	Clear
Fowler (no. 265–S)	2 miles west of Powell Station	6/20/50	1,328	80	59	Clear
		7/ 5/50	1,144	74	57	Do.
		8/ 3/50	4,326	78	58	Turbid
		9/12/50	1,126	71	58	Clear
		10/ 5/50	898	66	57	Do.
		11/14/50	817	36	56	Do.
		12/14/50	1,880	47	57	Do.
		1/16/51	4,425	31	57	Milky
		2/12/51	3,402	60	56	Clear
		3/19/51	3,743	44	57	......
		4/12/51	4,847	41	57	......
		5/ 8/51	2,042	72	57	Clear
		6/14/51	1,194	79	57	Do.

Analyses of representative samples of ground water from Knox County are given in table 50.

TABLE 49.–TYPICAL WELLS AND SPRINGS IN KNOX COUNTY

Shown on Plates 1, 2, 8, and 9

Method of lift: A, air lift; B, bucket; C, centrifugal; J, jet pump; L, lift pump; P, pitcher pump; T, turbine pump.
Use of water: Ab, abandoned; D, domestic; In, industrial; Ir, irrigation; P, public supply; S, stock

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	BEARDEN																
1	1 mi. E.	(b) (6)	....	Hilltop	1,040	100	......	....	Dolomite	Ꞓcr	......	......	L	......	....	D	
2	1½ mi. SE.		....	Valley	830	120	......	6	do.	On	......	......	L	......	....	D	
3–1	2 mi. SE.		....	Hilltop	900	97	......	6	Limestone	Oh	......	......	L	......	....	D	
3–2	do.	do.	....	Slope	860	......	......	6	do.	Oh	......	......	B	......	....	D	
4	2 mi. S.	(b) (6)	....	Hilltop	1,050	400	60	6	do.	Oh	100	......	L	10	....	D	
5–S	2 mi. SE.		....	Valley	820	......	......	....	do.	Oh	......	......	....	150	57	D	
6	3 mi. SE.		....	Hilltop	900	......	......	6	Shale	Oo	......	......	J	......	....	D	
	ROCKFORD																
7–1	4 mi. NW.	(b) (6)	....	do.	910	136	......	8	Limestone	Oh	60	......	J	......	....	D	
7–2	do.	do.	....	Slope	860	125	......	6	do.	Oh	60	......	L	......	....	D	
	BEARDEN																
8	3 mi. S.	(b) (6)	Morris Forge & Drilling Co.	Ridge	830	100	35	6	do.	Oh	16	......	J	......	....	D	
9	2 mi. SE.		....	Hilltop	890	210	......	6	do.	Oh	......	......	J	......	....	D	
10	2½ mi. SE.		....	Slope	910	151	......	6	do.	Oh	95	......	L	3	....	D	
11	3 mi. SE.		....	Valley	830	......	......	6	do.	Oh	......	......	L	......	....	D	
12	3 mi. E.		....	Slope	850	70	......	8	do.	Oh	35	......	L	......	....	D	Water becomes turbid after prolonged pumping.
13	do.		....	do.	850	47	......	6	do.	Oh	......	......	....	......	....	Ab	

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	KNOXVILLE																
14	3½ mi. S.	(b) (6)	G.R.Goddard	Sink	930	69	44	6	Limestone	Ol	25	......	L	......	58	S	
15-S	3 mi. S.		......	do.	900	......	......	....	do.	Oh	......	......	....	50	....	D	
16-S	do.		......	do.	900	......	......	....	do.	Oh	......	......	....	100	....	....	Spring goes dry in summer.
17	do.		Miller	Slope	1,000	163	......	6	do.	Ol	......	......	L	......	....	D	
18	4 mi. SE.		do.	Valley	930	110	40	6	do.	Ol	60	......	....	5	....	....	
	BEARDEN																
19	4 mi. SE.		......	Slope	870	95	16	6	Shale	Oo	40	......	L	......	....	D	
20	do.		Fitts	Hilltop	880	125	30	6	do.	Oo	35	......	J	......	....	D	
21	do.		......	do.	880	160	82	6	do.	Oo	50	......	J	......	....	D	
22-S	do.		......	Valley	840	......	......	....	do.	Oo	......	......	....	......	....	D	
	KNOXVILLE																
23	3 mi. S.		Fitts	do.	915	104	104	6	do.	Oo	35	......	J	......	....	D	
24	4 mi. S.		Gib Goddard	Ridge	870	165	35	6	do.	Oo	40	......	J	......	....	D	Supplies three houses.
25-S	do.		......	Valley	840	......	......	....	Limestone	Oh	......	......	....	50	57	....	
26	3½ mi. SW.		......	Slope	890	78	40	6	Shale	Oo	20	......	J	......	....	D	
	BEARDEN																
27-1	3 mi. SE.		......	do.	900	106	......	6	Limestone	Oh	......	......	L	......	....	D	
27-2	do.	do.	Childress	do.	880	175	......	6	Shale	Oo	......	......	....	......	....	D	
28-1	4 mi. SE.	(b) (6)	Morris Forge & Drilling Co.	Valley	850	135	70	6	do.	Oo	25	......	J	......	....	D	
28-2	do.	do.	......	do.	850	97	......	5	do	Oo	......	......	L	......	....	D	
	ROCKFORD																
29	3 mi. N.	(b) (6)	......	Hilltop	960	345	......	6	Limestone	Oh	175	......	L	......	....	D	
30-S	3½ mi. N.	DeArmond Spring	......	Valley	825	......	......	....	do.	Oh	......	......	....	50	57	D	
31-S	do.	Blue Spring	......	do.	825	......	......	....	do.	Oh	......	......	....	50	57	D	
32	4 mi. N.	(b) (6)	......	Hilltop	980	165	70	6	do.	Oh	65	......	L	......	....	D	
33	do.		Gib Goddard	do.	1,000	205	......	6	do.	Oh	......	......	L	......	....	D	
	KNOXVILLE																
34	3 mi. S.	(b) (6)	......	do.	900	175	......	6	do.	Oh	......	......	L	......	....	D	
	BEARDEN																
35	4 mi. SE.	(b) (6)	Joe Neubert	Valley	820	47	10	6	do.	Oh	12	......	C	......	....	D	
	KNOXVILLE																
36	3 mi. S.	(b) (6)	Childress & Fitts	Ridge	950	121	40	6	Shale	Oo	44	......	J	5	....	D	
37-1	1½ mi. SW.	Robershaw-Fulton Co.	......	Valley	840	155	......	4	Dolomite	Oc	35	......	A	100	63	Ab	
37-2	do.	do.	......	do.	840	305	......	4	do.	Oc	35	......	A	250	63	Ab	
37-3	do.	do.	......	do.	840	505	......	10	do.	Oc	35	......	T	500	63	In	Yield drops after several hours pumping.
38	1½ mi. SW.	Atlantic Co.	Price	do.	850	385	100	6	do.	Oc	13	......	T	460	....	In	Well pumped at 250 gpm 24 hours a day in summer.
39	3½ mi. S.	(b) (6)	Joe Neubert	Slope	960	77	......	6	Limestone	Oh	14	......	J	......	....	D	
40	do.		......	do.	990	103	......	6	do.	Oh	89	......	L	......	....	D	
41	3 mi. S.		......	Valley	960	190	......	6	do.	Ol	60	......	....	......	....	D	
42-S	do.	Blue Spring	......	do.	920	......	......	....	do.	Oh	......	......	....	25	57	D	
43	3 mi. S.	Knoxville Fertilizer Co.	......	Slope	920	700	......	8	do.	Oh	300	......	A	100	....	In	
44-1	2 mi. S.	Candoro Marble Co.	......	Valley	870	380	10	6	Shale	Oo	65	......	T	500	....	In	Well pumped at 500 gpm 24 hours a day 5 days a week.
44-2	do.	do.	......	do.	870	350	10	6	do.	Oo	40	......	A	......	....	In	Standby well.
45	3 mi. S.	(b) (6)	......	Hilltop	940	120	20	6	Limestone	Ol	45	......	J	......	....	D	

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	ROCKFORD																
46	3 mi. N.	(b) (6)	...	Slope	870	150	10	6	Shale	Oo	40	...	J	...	...	D	
47	3 mi. NE.		Fitts	do.	865	100	20	6	Limestone	Oh	...	...	L	...	...	D	
48-S	do.		...	Valley	850	...	...	...	do.	Ol	...	...	...	100	58	D	Water slightly milky.
	NEUBERT																
49	3½ mi. SW.		...	Slope	880	50	12	6	Dolomite	O-Ꞓk	15	...	J	...	...	D	
50-S	3 mi. SW.		...	Valley	880	...	...	...	Limestone	Ol	...	...	...	20	58	D	
51	3½ mi. SW.		...	Slope	920	40	...	6	do.	Oh	10	...	J	...	...	D	
	WILDWOOD																
52-S	3 mi. N.		...	Valley	1,080	...	...	...	Sandstone	Ꞓr	...	...	...	25	58	D	
	ROCKFORD																
53	3 mi. E.		...	Slope	1,075	78	...	6	Limestone	Ol	...	...	L	...	...	D	
	WILDWOOD																
54	3½ mi. N.		...	Ridge	1,000	130	60	6	do.	Oh	90	...	L	...	...	D	
	NEUBERT																
55	3 mi. SW.		...	Slope	860	59	15	6	do.	Ol	25	...	L	...	...	D	
	LOUISVILLE																
56	2½ mi. NE.		...	do.	840	...	...	6	do.	Ol	120	...	L	...	...	D,S	
57-1	2 mi. NE.		...	Valley	850	100	...	6	do.	Ol	40	...	...	...	...	D	
57-2	do.	do.	...	Slope	880	410	160	6	do.	Ol	100	...	L	...	...	D,S	
	BEARDEN																
58-S	4 mi. SW.	Maxwell Spring	...	Valley	870	...	...	...	Dolomite	On	...	...	...	1,000	58	D	
59-S	3 mi. S.	(b) (6)	...	do.	840	...	...	...	Limestone	Oh	...	...	...	25	57	D	
60	do.	(b) (6)	...	Slope	990	107	50	6	Dolomite	On	40	...	J	...	...	D	
61	4 mi. S.		...	do.	840	152	...	6	Limestone	Oh	100	...	L	...	...	D,S	
62	do.		Jim Miller	do.	820	86	50	6	do.	Oh	45	...	L	...	...	D	
	LOUISVILLE																
63	3 mi. N.		do.	do.	860	87	40	6	Dolomite	On	40	...	L	10	...	D,S	
64	2½ mi. N.		L. Perry	Hilltop	850	125	40	6	Limestone	Ol	30	...	L	...	...	D	Well supplies three families.
65-S	3½ mi. N.	Seven Springs	...	Valley	820	...	...	...	Dolomite	On	...	...	...	1,200	58	D,S	Water sample analyzed.
66	1½ mi. NW.	(b) (6)	...	Slope	860	92	...	...	Limestone	Oh	82	...	L	...	...	D	Water level fluctuates with stage of lake.
67	3 mi. NW.		...	do.	830	130	...	6	Dolomite	On	30	...	J	...	...	D,S	
68	3½ mi. N.		Jim Miller	Valley	830	94	20	6	Limestone	Ol	6	...	L	...	...	D	
	BEARDEN																
69	2½ mi. S.		do.	Slope	990	108	20	6	do.	Ol	...	...	J	10	...	D	Flowing well.
	LOUISVILLE																
70	4 mi. N.		...	Valley	860	30	...	36	Dolomite	Oe	...	...	J	...	...	D	Flowing well. Water sample analyzed.
	CONCORD																
71	3 mi. E.		...	Slope	960	36	...	48	do.	Oo	4	2/49	L	...	...	D	
72	2½ mi. SE.		...	Valley	930	87	30	6	do.	Oc	20	...	L	...	...	D,S	
73	3 mi. E.		...	Slope	840	250	14	6	do.	On	27	...	B	...	...	D	
	BEARDEN																
74	2½ mi. SW.		...	do.	1,000	120	...	6	do.	Ꞓcr	60	...	J	...	...	D	
75	3½ mi. SW.		...	do.	1,030	153	...	6	do.	Oc	60	...	L	...	...	D	
	CONCORD																
76	4 mi. E.		...	Valley	880	82	...	6	Shale	Oo	25	...	L	...	...	D	
	LOUISVILLE																
77-1	4½ mi. N.	(b) (6)	...	do.	910	179	66	6	do.	Oo	12	...	L	12	...	D,S	
77-2	5 mi. N.	do.	...	Hilltop	1,150	410	80	6	Limestone	Oh	...	...	L	...	...	D	Well pumps dry in 45 minutes. Recovers slowly.

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	CONCORD																
78	2 mi. E.	(b) (6)	......	Slope	860	225	......	6	Shale	Oo	40	......	J	......	....	D,S	
79–S	1½ mi. E.		......	Valley	840	......	......	....	do.	Oo	......	......	....	500	57	D	
80	do.		......	do.	860	53	20	6	do.	Oo	0	2/49	J	10	....	D	Flowing well.
	BEARDEN																
81	5 mi. SW.		......	Hilltop	980	120	......	6	Dolomite	Olv	105	......	L	......	....	D,S	
82	4 mi. W.		......	Slope	880	92	20	6	Limestone	Ꞓmn	12	......	J	......	....	D,S	Water becomes cloudy after heavy rain.
83	1 mi. W.		......	do.	930	84	......	6	Dolomite	On	......	......	J	......	....	D	
84–1	2½ mi. SW.		......	Hilltop	1,110	229	90	6	Limestone	Oh	143	......	L	3	....	D	
84–2	do.	do.	......	Ridge	1,040	506	177	6	do.	Oh	60	......	L	3	....	D	Well pumps dry in 4 or 5 hours.
85–S	do.	(b) (6)	......	Slope	880	......	......	....	Dolomite	Ꞓcr	......	......	....	500	58	D	Water sample analyzed.
86	3½ mi. W.		......	Ridge	930	151	35	6	do.	On	......	......	J	......	....	D	Well draws down rapidly.
87–S	do.	do.	......	Valley	900	......	......	....	do.	On	......	......	....	300	58	....	
88	1½ mi. N.	(b) (6)	J. F. Brown	do.	960	79	35	6	Limestone	Ꞓcu	8	......	J	40	....	D	
89	3 mi. N.		......	Slope	980	138	40	6	Dolomite	On	35	......	J	3	....	D	
90	4 mi. N.		......	do.	1,070	174	85	6	do.	On	......	......	L	3	....	D	
91–S	4½ mi. N.	Schaad Spring	......	Valley	......	......	......	....	Shale	Ꞓc	......	......	....	450	57	....	Water sample analyzed.
92	4½ mi. NW.	(b) (6)	......	do.	1,040	87	40	6	do.	Ꞓc	8	......	J	......	....	D	
93–1	3 mi. NW.		......	Slope	1,130	116	......	6	Dolomite	Oc	40	......	J	......	....	D,S	
93–2	do.	do.	......	Valley	......	30	30	36	do.	Oc	22	......	L	......	....	D,S	
	BYINGTON																
94	½ mi. E.	(b) (6)	......	do.	......	54	13	6	Shale	Ꞓc	15	......	J	5	....	D	
	BEARDEN																
95–S	4½ mi. NW.	Johnson Spring	......	do.	......	......	......	....	do.	Ꞓc	......	......	....	150	57	D	
96	2 mi. W.	(b) (6)	......	Slope	1,040	165	40	6	Dolomite	On	72	......	L	......	....	D	
	BYINGTON																
97	2½ mi. E.		J. D. Miller	do.	1,040	113	20	6	do.	Ꞓcr	40	......	J	......	....	D	Well supplies four or five families.
98	1½ mi. E.		do.	do.	1,030	85	85	6	Shale	Ꞓc	20	......	J	......	....	D	
99–S	2 mi. E.		......	do.	1,060	......	......	....	do.	Ꞓc	......	......	....	100	57	D	
	BEARDEN																
100	3½ mi. W.		DeArmond	do.	980	124	18	6	Dolomite	On	65	......	J	......	....	D,S	
	BYINGTON																
101	4½ mi. S.		J. L. Miller	Valley	920	150	20	6	Limestone	Ꞓm	......	......	J	......	....	D,S	
102	3 mi. S.		......	do.	950	90	1	6	Dolomite	On	......	......	J	......	....	D	Water becomes muddy after heavy rain.
103	2 mi. S.		Arnett	Slope	1,060	130	80	6	do.	Ꞓcr	65	......	J	......	....	D	
104	½ mi. NW.		DeArmond	do.	1,060	167	70	6	Shale	Oo	10	......	L	......	....	D,S	
105–1	2 mi. NE.		......	Valley	1,000	70	30	6	Limestone	Om	30	......	J	......	....	In	
105–2	do.	do.	......	do.	1,000	70	30	6	do.	Om	30	......	....	......	....	D	
106	2½ mi. NE.	(b) (6)	Sommers	Hilltop	1,010	86	86	6	Shale	Oo	32	......	J	......	....	D,S	Water milky in rainy weather.
107	1½ mi. N.		Jack Fitts	Slope	1,005	150	30	6	Dolomite	O-Ꞓk	50	......	L	......	....	D,S	
108	1½ mi. W.		DeArmond	do.	970	76	......	6	do.	O-Ꞓk	30	......	L	......	....	D	
	BYINGTON																
109	1½ mi. NW.		J.M.Stafford	Hilltop	1,110	172	82	6	do.	O-Ꞓk	100	......	J	10	....	D	
110	2½ mi. NW.		J. D. Miller	Slope	1,050	128	90	6	do.	O-Ꞓk	83	......	J	......	....	D	
111–1	4 mi. W.		D. Stafford	do.	850	61	33	6	Shale	Ꞓc	25	......	L	......	....	D	
112	4 mi. W.		Davis	do.	850	200	21	8	do.	Ꞓc	12	3/49	....	......	....	Ab	
113	5 mi. W.		D.C.Summers	do.	840	65	32	6	Dolomite	O-Ꞓk	42	......	J	6	....	D	
114–S	do.		......	Valley	770	......	......	....	do.	O-Ꞓk	......	......	....	500	57	D	
115	2 mi. SW.		......	Slope	1,000	115	35	6	Shale	Oo	39	......	L	......	....	D	
116	4 mi. SW.		J. D. Miller	Valley	960	86	25	6	do.	Oo	13	......	J	5	....	D	
	CONCORD																
117–S	5 mi. NW.	Fitts Spring	......	do.	980	......	......	....	Dolomite	O-Ꞓk	......	......	....	250	57	D	

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth of water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	BYINGTON																
118-S	4 mi. W.	Maddox Bros.		Valley	960				Dolomite	O-€k				450	57	D	
119-S	7 mi. W.	(b) (6)		do.	775				do.	O-€k				300	57	D	
	CONCORD																
120	2½ mi. N.	(b) (6)		Slope	930	128	15	6	Shale	Oo	28		L			D	
121-S	3 mi. N.	Blue Spring		Valley	920				Limestone	Ochl				700	58	D,S	
	BYINGTON	(b) (6)															
122	3 mi. SW.		J. Davis	Slope	1,100	89	70	6	Shale	€c	30		L			D,S	
123	4 mi. SW.			Valley	1,030	47	47	6	do.	€c	18		J			D	
	CONCORD																
124	4½ mi. NW.		Ed Davis	Slope	1,000	37	20	6	do.	€c	12		L			D	
125-S	5 mi. W.			Valley	970				do.	€c				150		D	
	MARTEL																
126	4½ mi. N.		J. Davis	Slope	910	107	50	6	do.	€c	10		L	10		D	
127	6 mi. N.			do.	900	185		6	Dolomite	O-€k	50		L			D	Water becomes cloudy after rains.
	CONCORD																
128	5½ mi. NW.		Jim Stafford	do.	900	150	100	6	Shale	Oo	20		J			D	
129	3½ mi. W.		J. D. Miller	Valley	975	103	40	6	do.	Oo	38		J			D	
130-S	1½ mi. NW.			do.	880				Limestone	€mn				500		P	
131	2½ mi. NW.		J. D. Miller	Ridge	1,000	130	22	6	Shale	Oo	80		J			D	
132	½ mi. SW.		DeArmond	Hilltop	845	147	7	6	Dolomite	On	99		J	10		D,S	
133	3½ mi. S.			Valley	900	40	40	4	do.	€cr	5		L			Ab	
	MARTEL	(b) (6)															
134	3 mi. E.			Hilltop	925	212		6	do.	€cr			L	5		D	
135	3 mi. NE.		J. D. Miller	Valley	960	186	42	6	do.	€cr	86		J	10		D	
136	3 mi. N.		Moneymaker	Hilltop	1,000	50	33	6	Limestone	Ochl	29		J	10		D	
	CONCORD																
137	2½ mi. W.			Slope	875	214	3	6	Dolomite	Oc	100		L			D	
	OAK RIDGE																
138	5 mi. S.		Davis	Valley	840	60	31	6	Shale	€c	27		L			D	
	ROCKFORD																
139	4 mi. NE.		Gib Goddard	Slope	880	94	40	6	do.	Oo	24		J	20		D	
140	do.		Childress & Fitts	do.	870	152	40	6	do.	Oo	11		J	20		D	
	NEUBERT																
141	2 mi. W.		Gib Goddard	do.	890	92	18	6	do.	Oo	30		J			D	Water becomes cloudy after heavy rains.
142	1 mi. S.		Hickman & Carrigan	do.	965	70	30	6	do.	Oo	30		L			D	
143	1 mi. E.		Parrott	Valley	970	135	20	6	do.	Oo	35		J			D	
144-S	2 mi. E.			do.	940				do.	Oo				700		D,S	
145	4 mi. E.		DeArmond	Slope	1,020	78		6	Limestone	Ob	32	4/49	B			D	
	SEYMOUR																
146	3½ mi. NW.		Parrott	do.	930	141	42	6	Shale	Oo	20		J	15		D	
	NEUBERT																
147	4½ mi. NE.		do.	do.	850	110	17	6	Sandstone	Ob	20		J			D	
	SEYMOUR																
148-1	5½ mi. NW.			Valley	850	45		6	Limestone	Ol	20		L			S	
148-2	do.	do.		Hilltop	910	116		6	do.	Ol	50		L			D	
	NEUBERT																
149	3 mi. NE.	(b) (6)	Parrott	Slope	860	66	20	6	Sandstone	Ob	22		L			D	
150	2 mi. NE.		do.	Ridge	910	70	25	6	Shale	Oo	40		J			D	Well has been pumped dry.

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
151	KNOXVILLE 2½ mi. SE.	(b) (6)	Glenn White	Slope	980	168	......	6	Limestone	Oh	......	......	L	......	......	D	Water becomes muddy frequently. Water sample analyzed.
152	NEUBERT 2½ mi. NW.		......	do.	930	120	......	6	do.	Ol	60	......	L	......	......	D	Water becomes muddy occasionally.
153	1 mi. N.		Cutshaw	Valley	925	100	......	6	Shale	Oo	40	......	J	......	......	P	
154	3 mi. N.		......	Ridge	890	78	......	6	Limestone	Ol	31	4/49	B	......	......	D	Water dingy after hard rain.
155-1	KNOXVILLE ½ mi. E.	East Tennessee Packing Co.	Wm. Cox	Valley	830	213	40	8	Dolomite	On	45	......	T	300	......	D	Reported drawdown of 1 foot after 1 hour pumping at 300 gpm.
155-2	½ mi. E.	do.	J. J. Morris	do.	840	300	44	10	do.	On	50	......	T	375	......	In	
155-3	do.	do.	......	do.	830	100	40	8	do.	On	45	......	A	325	......	Ab	
156	1 mi. E.	Dixie Laundry Co.	Wm. Cox	do.	830	201	22	6	do.	On	20	......	T	350	......	In	
157	MARTEL 2½ mi. SW.	(b) (6)	Arnett	Ridge	1,070	154	40	6	do.	Oc	......	......	L	......	......	D	
158	BEARDEN ½ mi. S.	Baum's Greenhouse	Price	Valley	890	424	21	6	Shale	Oo	30	......	T	50	......	In	Water sample analyzed.
159	KNOXVILLE 4 mi. E.	(b) (6)	Perry	Slope	855	150	40	6	do.	Oo	30	......	......	......	......	Ab	
160-1	NEUBERT 4 mi. N.	(b) (6)	J. D. Miller	Valley	880	75	......	6	Limestone	Ol	......	......	......	......	......	Ab	
160-2	do.	do.	do.	do.	880	165	20	6	do.	Ol	......	......	L	50	......	In	
160-3	do.	do.	do.	do.	880	225	20	6	do.	Ol	......	......	T	......	......	In	Water samp [illegible] analyzed.
161	KNOXVILLE 4 mi. E.	(b) (6)	DeArmand	Hilltop	890	225	......	6	do.	Oh	125	......	L	......	......	D,S	
162	NEUBERT 4½ mi. N.		J. D. Miller	Valley	860	90	40	6	do.	Ol	35	......	J	......	......	D	
163	BEARDEN 2 mi. NE.		do.	Slope	900	192	80	6	Dolomite	Oc	62	......	L	......	......	D	
164	CONCORD In town	Aichton Memorial Baptist Church	......	Ridge	885	220	......	6	do.	Olv	85	......	L	......	......	D	Do.
165	do.	(b) (6)	J. D. Miller	Slope	860	91	60	6	do.	Oc	50	......	J	20	......	D	Do.
166	KNOXVILLE 5½ mi. E.	(b) (6)	Yardley	Hilltop	905	104	......	6	Limestone	Oh	20	......	L	......	......	D	Water becomes muddy after rains.
167-1	do.	(b) (6)	H. Drummer	Valley	848	50	21	6	Shale	Oo	0	......	J	20	......	In	Water sample analyzed.
167-2	do.	do.	J. Stiles	do.	848	100	......	8	do.	Oo	3	......	J	35	......	In	
167-3	do.	do.	do.	do.	845	60	......	8	do.	Oo	0	......	L	10	......	In	
168	NEUBERT 5½ mi. NE.	(b) (6)	J. D. Miller	Hilltop	960	122	6	6	Limestone	Ol	40	......	J	......	......	D	
169	MASCOT 5½ mi. S.		J. C. Arnett	do.	1,110	168	147	6	Dolomite	Oms	96	......	L	5	......	D	Water sample analyzed.
170	6 mi. SW.		Zoller	Ridge	900	51	14	6	Shale	Oo	20	......	L	......	......	D	
171	KNOXVILLE In town	Hotel Farragut	Morris Drilling Co.	do.	940	765	110	8	Dolomite	Ccr	90	......	A	80	......	In	
172	3 mi. NE.	(b) (6)	......	Slope	960	150	......	8	do.	Oc	100	......	......	......	......	Ab	
173	1 mi. N.	C & S Laundry	......	Valley	900	400	......	6	Sandstone	Ob	......	......	......	......	......	Ab	Water too muddy to use.

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
174-1	2 mi. N.	Winter Garden Co.	Morris Drilling Co.	Valley	960	1,000	.....	6	Limestone	Ɛcu	.....	.....	.....	3	.....	Ab	
174-2	do.	do.	do.	do.	960	400	20	6	do.	Ɛcu	.....	.....	T	60	.....	In	
174-3	do.	do.	do.	do.	960	250	20	8	do.	Ɛcu	20	.....	T	400	.....	In	
175	1½ mi. W.	(b) (6) Marble Co.	.....	Slope	870	500	.....	8	Shale	Oo	30	.....	T	500	.....	In	
176	1 mi. W.	Rohm & Haas Co.	Southern Railway	Valley	890	160	20	.....	Sandstone	Ob	34	.....	T	100	.....	Ab	
177	2 mi. S.	Vestal Lumber Co.	.....	do.	830	300	.....	6	Shale	Oo	25	.....	A	100	.....	In	
178	2½ mi. N.	J. Allen Smith Co.	Morris Drilling Co.	do.	900	380	35	8	Sandstone	Ob	100	.....	T	80	.....	In	
179-1	3 mi. E.	(b) (6)	do.	Sink	900	120	30	6	Limestone	Ob	15	.....	J	1	.....	D	
179-2	do.	do.	do.	Slope	860	110	25	6	do.	Ob	15	.....	J	.....	.....	D,S	
179-3	do.	do.	.....	do.	840	75	.....	6	do.	Ob	30	.....	L	.....	.....	Ab	
180	2 mi. N.	Cockrum Lumber Co.	.....	do.	920	75	.....	6	Dolomite	Oa	25	.....	L	.....	.....	In	
181	do.	Tennessee Flooring Co.	.....	do.	930	250	.....	6	do.	Oa	90	.....	T	120	.....	In	
	BEARDEN																
182	1½ mi. E.	Cherokee Country Club	Morris Drilling Co.	do.	980	709	.....	6	do.	Ɛcr	200	.....	T	20	.....	In	
	SEYMOUR																
183-S	3 mi. N.	(b) (6)	.....	do.	870	.....	.....	.....	do.	O-Ɛk	.....	.....	.....	1,000	.....	D	
184-1	5 mi. N.	(b) (6)	M. S. King	Valley	865	113	45	6	Shale	Oo	31	.....	J	.....	.....	D,S	
184-2	do.	do.	.....	do.	865	40	.....	48	Sandstone	Ob	35	.....	L	.....	.....	D	
185	3½ mi. N.	(b) (6)	.....	Hilltop	1,010	200	.....	8	Dolomite	O-Ɛk	50	.....	J	.....	.....	D,S	
	MASCOT																
186	5 mi. S.	(b) (6)	Jake Nicely	Slope	940	101	.....	6	do.	Oma	33	.....	L	.....	.....	D	
187-S	5½ mi. S.		.....	do.	900	.....	.....	.....	do.	Oma	.....	.....	.....	1,500	58	D, S	
	BOYDS CREEK																
188	5 mi. NW.		M. Coker	Hilltop	950	92	.....	6	Shale	Oo	52	.....	B	.....	58	D	
189	3 mi. NW.		.....	Slope	990	.....	.....	6	Limestone	Ol	25	.....	L	.....	.....	D	
190	2½ mi. NW.		.....	do.	910	.....	.....	6	Shale	Ɛpv	.....	.....	L	.....	.....	D,S	
191	4 mi. N.		.....	do.	980	54	.....	6	do.	Oo	27	2/49	B	.....	58	D	
	KODAK																
192	4½ mi. NW.		Styles	do.	980	103	.....	6	do.	Oo	23	.....	J	.....	.....	D	
	MASCOT																
193	1 mi. NW.		Arnett	Hilltop	980	252	.....	6	Limestone	Ɛcu	.....	.....	L	.....	.....	D	
194-1	3 mi. N.		.....	do.	1,010	90	.....	6	do.	Ɛcu	.....	.....	L	.....	.....	D	Water becomes muddy after hard rain.
194-2	do.	do.	.....	Slope	1,010	90	.....	6	do.	Ɛcu	.....	.....	L	.....	.....	D	
	STRAWBERRY PLAINS																
195-S	3 mi. N.	(b) (6)	.....	Valley	920	.....	.....	.....	Dolomite	Oma	.....	.....	.....	500	.....	D,S	
	MASCOT																
196-S	2 mi. NE.	(b) (6)	.....	do.	980	.....	.....	.....	Limestone	Ol	.....	.....	.....	500	59	D,S	
197	2½ mi. S.	Helms Grill	.....	Slope	980	250	.....	6	Shale	Oo	.....	.....	.....	.....	.....	P	
198-S	3½ mi. S.	(b) (6)	.....	Valley	990	.....	.....	.....	Dolomite	Oma	.....	.....	.....	150	59	D	
	STRAWBERRY PLAINS																
199-S	3¼ mi. SW.	Carter Mill Springs	.....	do.	915	.....	.....	.....	do.	Ok	.....	.....	.....	4,000	59	.....	
200-S	4 mi. S.	(b) (6)	.....	do.	890	.....	.....	.....	Limestone	Ol	.....	.....	.....	200	59	D,S	
201-S	do.	Boiling Springs	.....	do.	900	.....	.....	.....	do.	Ol	.....	.....	.....	4,000	59	D,S	
202-S	2 mi. S.	(b) (6)	.....	do.	940	.....	.....	.....	Dolomite	Oma	.....	.....	.....	20	60	S	
203	1½ mi. SW.		.....	Hilltop	950	105	.....	6	Shale	Oo	14	.....	L	.....	.....	D	

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	MASCOT																
204	2 mi. SE.	(b) (6)		Hilltop	945	75		6	Shale	Oo			L			D	
205	1½ mi. S.	(b) (6)		Valley	895	70		6	do.	Oo	18		J			D	
	STRAWBERRY PLAINS																
206	3 mi. S.			Slope	1,190	200			Dolomite	Oc			B			D	
	FOUNTAIN CITY																
207	5 mi. E.		Tom McNutt	Valley	840	209	40	6	Shale	Oo	57					In	
	MASCOT																
208	5 mi. SW.			Slope	940	105	40	6	do.	Oo	50		J			D	
209	3½ mi. SW.	Westland Dairy		Valley	900	200		6	do.	Oo			L			In,S	
210	2 mi. SW.	(b) (6)		Slope	870	78		6	do.	Oo	30		J			D,S	
211	do.	(b) (6)		Hilltop	925	79		6	do.	Oo			L			D	
212	do.	(b) (6)		Slope	875	200		6	do.	Oo			L	50		D,S	
212	5 mi. SW.	(b) (6)		do.	930	100		6	do.	Oo	40		B			D	
	FOUNTAIN CITY																
214-S	4½ mi. SE.	(b) (6)		Valley	895				do.	Oo				30	61	D	
215-S	4½ mi. E.	Netherland Heights Spring	Tom McNutt	do.	990				Sandstone	€r				200	59	D	
216	3½ mi. E.	(b) (6)		Hilltop	1,030	185		6	Shale	€c			L			D	
217	4½ mi. SE.	(b) (6)		Slope	1,020	150		6	Dolomite	Olv			L			D	Water very muddy.
	MASCOT																
218	5 mi. W.	Jones Food Market		do.	930	106		6	do.	Ok	80		J			D	
219	do.	(b) (6)		do.	1,015	162		6	Limestone	€cu			J			D	
220	3 mi. W.	(b) (6)		do.	970	125		6	Dolomite	Olv			L			D	
	FOUNTAIN CITY																
221-S	5 mi. NE.	Vandergrift Spring		do.	1,120				Shale	€c				10	57	D	
	CORRYTON																
222	5 mi. SW.	(b) (6)		Hilltop	1,130	130		6	do.	Omb			L			D,S	
223	4 mi. SW.	(b) (6)		do.	1,135	90		6	do.	Omb			L			D,S	
	MASCOT																
224	5½ mi. W.			do.	1,115			6	do.	Oo			J			D	
	CORRYTON																
225-S	4 mi. SW.			Valley	1,030				Limestone	Ochl				500	57	D	Water sample analyzed.
	FOUNTAIN CITY																
226-S	4½ mi. NE.			do.	1,060				Shale	Oo				20	58	D	Do.
227	do.			Slope	1,100	135		6	Limestone	Ochl	50		L			D	
	CORRYTON																
228	2½ mi. SW.	Sprankle Grocery		Valley	1,065	86		6	Shale	Oo			L			D	
	MASCOT																
229	4 mi. NW.	(b) (6)		Slope	1,055	112		6	do.	Omb			J			D	
230	4 mi. W.	(b) (6)		Valley	1,070	104		6	Limestone	€cu	30		L			D	
231-S	do.	(b) (6)		do.	1,160				do.	€cu				50	58	D,S	
232	2 mi. NW.	Wilson & Harris		do.	980	115	20	6	do.	€cu			L			In	
233	2 mi. W.	(b) (6)		Hilltop	1,020	240		8	Dolomite	Oc	115		L			P	Supplies six residences and one store.
	FOUNTAIN CITY																
234-S	In town			Valley	990				Shale	Oo				10			
235-S	do.	(b) (6)		do.	970				do.	Oo				80			

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
236-S	2½ mi. NE.	Beverly Hills Sanitorium	...	Valley	1,040	...	...	...	Dolomite	Olv	...	...	...	1,000	57	D,S	
237-S	3½ mi. E.	(b) (6)	...	Slope	1,000	...	...	...	Shale	Ꞓc	...	...	...	200	57	D	
	HEISKELL																
238	4 mi. NE.	(b) (6)	Summers	do.	920	94	...	6	do.	Ꞓcm	10	...	...	...	...	D	
239	3 mi. E.	(b) (6)	John Davis	do.	890	77	5	6	Limestone	Ꞓcu	...	...	...	...	...	D	
240-S	4½ mi. NE.	Knox County	...	do.	1,050	...	...	...	do.	Ꞓcu	...	...	...	500	56	D	Considerable seasonal variation.
	FOUNTAIN CITY																
241-S	4½ mi. NW.	Lewis Dail	...	Valley	1,150	...	...	...	Dolomite	Oc	...	...	...	100	57	D	Water slightly turbid.
242-1	In town	Knox County Water Works	Morris Drilling Co.	do.	970	300	300	8	Limestone	Ochl	0	3/48	...	500	57	Ab	Well pumped at 500 gpm for 7 days. Water too turbid for use.
242-2-S	do.	do.	...	do.	990	...	...	...	Dolomite	Oma	...	...	...	300	...	P	Water sample analyzed.
242-3-S	do.	do.	...	Slope	975	...	...	...	do.	Oma	...	...	...	80	...	P	
242-4-S	½ mi. SW.	do.	...	Valley	980	...	...	...	Limestone	Ochl	...	...	...	25	...	P	
242-5-S	In town	do.	...	Slope	980	...	...	...	do.	Ochl	...	...	...	200	...	P	
243-S	3 mi. NW.	Big Spring	...	Valley	1,010	...	...	...	Shale	Oo	...	...	...	500	...	...	
244-S	4 mi. NW.	...	...	do.	1,100	...	...	...	Dolomite	Olv	...	...	...	10	58	S	
	POWELL STATION																
245-S	2½ mi. NE.	(b) (6)	...	do.	1,000	...	...	...	Shale	Oo	...	...	...	500	57	D	
	FOUNTAIN CITY																
246-S	5 mi. N.	(b) (6)	...	do.	1,190	...	...	...	Dolomite	Oc	...	...	...	10	57	D	
247-S	6 mi. N.	(b) (6)	...	do.	1,140	...	...	...	do.	Oc	...	...	...	500	56	D	
248-1	4½ mi. N.		Irvin Gant	Slope	1,070	24	...	6	Limestone	Om	...	...	L	...	...	D	Water sample analyzed.
248-2	do.	do.	Otis Sweet	do.	1,075	87	...	6	do.	Om	...	...	J	...	...	D	
248-3	do.	do.	Vinyard	do.	1,100	90	...	6	do.	Om	...	...	J	...	...	D	
249	6 mi. NE.	(b) (6)	...	do.	1,145	65	...	6	do.	Om	...	...	L	...	...	D	
250	2½ mi. N.		Roscoe Summers	do.	1,060	108	...	...	do.	Om	...	...	L	...	...	D	
251-S	3 mi. NE.		...	Valley	1,080	...	...	...	Shale	Ꞓc	...	...	...	10	57	D	
252	do.		...	Hilltop	1,120	100	...	6	do.	Ꞓc	...	...	L	...	...	D	
253	2 mi. NW.		Roscoe Summers	Slope	1,080	214	90	6	do.	Ꞓc	...	...	B	...	...	D	
	POWELL STATION																
254-S	2½ mi. E.	Community Spring	...	Valley	1,020	...	...	...	do.	Ꞓc	...	...	...	300	56	D	
	FOUNTAIN CITY																
255	4 mi. SW.	W. P. McFadden	...	Slope	1,105	100	...	6	Dolomite	Ok	...	...	J	...	...	P	Supplies water for 30 trailers.
	HEISKELL																
256-S	3 mi. NE.	Foster Hopkins	...	Valley	935	...	...	...	Limestone	Olmc	...	...	...	5	59	D	
257	do.	(b) (6)	...	do.	880	17	...	36	Shale	Ꞓcm	4	...	B	...	...	D	
258	do.		Dillion Summers	Slope	890	85	...	6	do.	Ꞓcm	...	...	L	...	...	D	
259	1 mi. N.		...	do.	920	22	...	48	Dolomite	On	...	...	P	...	...	D	Water sample analyzed.
260	½ mi. W.		Roscoe Summers	Valley	900	60	10	6	Limestone	Olmc	10	...	P	...	...	D	
261	2 mi. SW.		Otis Sweet	do.	885	85	18	6	do.	Olmc	60	...	J	...	...	D	
262-S	2 mi. E.		...	do.	855	...	...	...	Shale	Ꞓcm	...	...	...	2	58	D	
	POWELL STATION																
263	1½ mi. NE.		...	Slope	1,100	146	40	6	Dolomite	O-Ꞓk	90	...	L	...	...	D,S	
	HEISKELL																
264	1 mi. SE.		Roscoe Summers	do.	900	54	40	6	Shale	Ꞓcm	30	7/49	J	...	...	D	

TABLE 49.—TYPICAL WELLS AND SPRINGS IN KNOX COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth of water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	POWELL STATION																
265-S	2 mi. W.	Fowler Spring		Valley	880				Dolomite	O-Ꞓk				800	57	D	Water sample analyzed.
	BYINGTON																
266	3 mi. NE.	Horace Davis		Slope	1,050	40		48	do.	O-Ꞓk	20		P		68	D	
	POWELL STATION																
267	3 mi. SW.	(b) (6)	Sweet	Valley	1,000	60		6	Limestone	Ochl	45		J			D	
268	1½ mi. SW.	(b) (6)	C. B. Parker	Slope	1,050	145	135	6	Dolomite	O-Ꞓk	70		J			D	
269-1	1 mi. SW.	W. W. Weigle & Son		do.	1,040	113		6	do.	O-Ꞓk			J	40		In	
269-2	do.	do.		do.	1,040	120		6	do.	O-Ꞓk			L	11		In	
269-3	do.	do.		do.	1,040	140		6	do.	O-Ꞓk			L	14		In	
270-S	In town	Gills & Fletcher		Valley	990				do.	O-Ꞓk				200	57	D	Do.
271	1½ mi. S.	(b) (6)		Slope	1,145	112	16	6	do.	O-Ꞓk	20		J			D	
	CORRYTON																
272	1 mi. NW.		Walt Adkins	Valley	1,090	50	50	6	Shale	Omb	30		L		63	D	
273	In town		Jake Nicely	do.	1,040	86		6	do.	Oo	17		J			P	Supplies seven houses.
274	1½ mi. SE.		Arnett	Slope	1,005	536	40	6	Limestone	Om	60		J			D,S	Water sample analyzed.
275	1½ mi. SW.		O. G. Stephens	Valley	1,030	48	20	6	Shale	Oo	12		L		62	D	
276	2 mi. SW.		Burton & Anderson	do	1,075	93	24	6	do.	Oo	45	7/49				D	
277	3 mi. SW.			do.	1,085	50		6	do.	Oo	20		L			D	
278	3 mi. W.		C. B. Parker	Hilltop	1,140	100		6	Limestone	Om	50		L			D	
	POWELL STATION																
279	2½ mi. W.	(b) (6)		Slope	1,110	45		6	Shale	Oo	18		L			D	Well can be pumped dry.
280	4½ mi. W.		C. B. Parker	do.	1,290	200	91	6	Dolomite	Ꞓcr	79		B	6		D	
281	do.		O. Sweet	Valley	1,155	80		6	Shale	Oo	60		L			D	
	ANDERSON-VILLE																
282-S	4½ mi. SE.			Slope	995				Dolomite	Oma				3		D	
283	5 mi. SE.			Valley	960	85	86	6	Limestone	Ochl	15		J			D	
284	6 mi. SE.		John Davis	do.	990	42	10	6	do.	Ꞓcu	7		J			D	
	CORRYTON																
285-S	5½ mi. W.	Clear Springs		Slope	1,275				Dolomite	Oc				30	57	D	
	FOUNTAIN CITY																
286-S	7 mi. N.	(b) (6)		do.	1,240				do.	Ꞓcr				10	58	D	
	ANDERSON-VILLE																
287	7½ mi. E.		Trent Hall	do.	1,130	58	10	6	Limestone	Ꞓcu	23		L			D	Water sample analyzed.
	CORRYTON																
288-S	6½ mi. W.			Valley	1,015				Shale	Ꞓcm				2	56	D	Water becomes turbid in wet weather.
	BLAINE																
289	2 mi. W.		Granger Burton	Slope	1,070	71	30	6	Limestone	Om	31		J			D	
	FOUNTAIN CITY																
290-S	6½ mi. N.	Roaring Spring		Valley	1,000				do.	Ꞓcu				500	58		

TABLE 50.—ANALYSES OF GROUND WATER IN KNOX COUNTY

(Chemical constituents in parts per million)

Well or spring No.	Owner or name of spring or well	Geologic horizon	Date of collection	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na & K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Hardness as $CaCO_3$	Specific Conductance (Micromhos at 25°C.)	pH
65-S	Seven Springs	On	2/ 7/49	0.09	19	9.6	....	12	101	2	2.0	....	....	87	193	8.3
70	R. A. Engert	Oc	4/19/50	.12	19	10	2.6	0	104	3	2.5	0	2.9	88	183	7.7
85-S	Oehler Spring	Ꞓcr	4/17/50	.07	33	19	.9	0	180	6	4.0	0	3.7	160	282	8.2
91-S	Schaad Spring	Ꞓo	4/19/50	.08	40	12	.2	0	172	3	2.0	0	3.3	149	271	8.3
151	L. Nelson	Oh	5/ 7/49	.07	32	6.4	....	0	93	25	6.5	....	....	106	248	7.6
158	Baum's Greenhouse	Oo	4/14/49	.08	23	9.3	....	0	119	17	7.5	....	....	96	295	8.1
160-3	F. A. Weigel, Jr.	Ol	9/ 7/50	.09	33	3.2	....	0	104	5	1.8	0	3.7	96	176	8.1
164	Aichton Memorial Baptist Church	Olv	4/19/50	.31	38	30	2.9	0	204	3	9.2	0	....	177	327	7.5
165	[redacted]	Oo	5/16/49	.09	23	11	....	0	127	3	1.0	....	....	103	216	8.1
167-1		Oo	9/ 7/50	.10	32	9.2	....	0	134	14	7.2	0	4.3	118	263	8.2
169		Oma	5/21/49	.11	27	8.1	....	16	121	2	1.5	....	....	101	242	8.4
225-S		Ochl	4/17/50	.12	44	11	11	0	211	3	1.5	0	....	155	331	7.6
226-S		Oo	4/17/50	.15	31	4.1	5.6	0	119	3	3.2	0	1.7	94	205	8.1
242-2-S	Knox County Water Works	Ochl	4/17/50	.11	38	17	1.5	0	188	5	6.2	0	....	165	319	8.4
248-2	[redacted]	Om	4/17/50	.06	28	15	74	0	284	44	9.8	.1	....	132	491	8.5
260		Olmc	4/18/50	.07	25	14	1.4	0	140	2	3.8	0	1.1	120	216	8.2
265-S	Fowler Spring	OꞒk	4/18/50	.05	30	17	2.5	0	173	2	1.8	0	2.8	143	268	8.4
270-S	Gills & Fletcher	OꞒk	4/18/50	.05	23	11	.6	0	113	3	2.0	0	6.9	103	194	8.2
274	[redacted]	Om	4/17/50	.07	66	2.0	13	0	213	20	3.5	.1	....	173	398	8.3
287		Ꞓcu	4/17/50	.15	68	7.8	5.4	0	238	6	8.5	.1	....	202	394	8.4

" Project review information for endangered species and critical or sensitive habitat "

TDEC/Division of Natural Heritage. 1997. "Project review information for endangered species and critical or sensitive habitat," memorandum to F. Grubbs (TDEC/DSF/NCO) from A. Barass (TDEC/DNH), dated October 8. Smokey Mountain Smelters Project, along Flenniken Branch to Tennessee River, near Knoxville, Knox County, TN.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

D 10-9-97

JTW 10/9/9

DIVISION OF SUPERFUND

97 OCT -9 AM 9:17

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

October 8, 1996

MEMORANDUM

To: Mr. Frank Grubbs, Deputy Director
Division of Superfund, TDEC

From: Andrew N. Barrass, Ph. D.,
Environmental Review Coordinator
Division of Natural Heritage, TDEC

Subject: Project review information for endangered species and critical or sensitive habitat

Please be advised that a review of our Departmental data bases indicates recorded threatened and/or endangered species near the project boundaries and within a one mile radius of the proposed project. These species have very specific or rare habitat. Please see the attached listing for further *habitat* information. Our records also indicate additional species occurrence records within an approximate four mile radius of the proposed project site(s). The review is for the proposed **Smokey Mountain Smelters Project [TDSF #47559], along Flenniken Branch to Tennessee River, near Knoxville, Knox County, TN** project site(s). As per your request, the species that have recorded occurrences are listed by quad map and are attached.

The information provided is sensitive to the protection of rare habitat, threatened or endangered species, and natural areas which our Department has the responsibility to protect. Therefore, we would request that this information **only** be used as a research tool by your professional staff and not be made available to the public or anyone outside of your Division.

The results of our review do not mean that a comprehensive biological survey has been completed. Because of the presence of threatened or endangered species near the project area (within a mile radius), it is probable that those species will occur in the project area if suitable habitat exists. Therefore we would *recommend* that a survey of the project sites be conducted prior to project implementation. Please notify our office of your findings.

We recognize the importance of stream bank habitat to improving water quality and preventing soil erosion. We would suggest that stream bank, stream side and riparian zones be restored to habitat that is representative of eco-specific communities found within the project area. Any restoration activities should include the use of native plant species.

In order to comply with the National Environmental Policy Act consideration should be given to the comprehensive and *cumulative* impacts associated with the project actions. Based upon the information provided, it is probable that any proposed stream crossing will impact instream, aquatic, habitat and riparian habitat as part of the construction. Techniques for streamside reconstruction and sediment retention are outlined in the following documents prepared by our Department:

1. **Tennessee Erosion Control Handbook, July 1992.**

2. **Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites, March 1992.**

3. **Riparian Restoration and Streamside Erosion Control Handbook, November 1994.**

Please refer to the documents when planning measures to lessen the construction impacts.

In addition to our standard project review and data search of the **Biological Conservation Data System,** we typically include information from the **Rivers Assessment Program** data base. The Rivers Assessment Program provides information on the ecological, recreational and aesthetic quality of the river corridors. The data is particularly useful in evaluating the potential for riparian habitat impacts as well as downstream aquatic habitats and recreational impacts of the proposed project. This information however, is currently ***not*** available for this watershed (please see attached Memo).

We appreciate the opportunity to assist you with your pre-project planning. If we can be of further assistance with your project or by interpreting data elements please contact our office in Nashville, telephone **615/532-0431**.

Please find attached the listings of the various data occurrences or elements from our Biological Conservation Data System, BCD, that have been retrieved from our computer data bases. The information provided is current for this quarter of the calendar year. Our information is continuously being updated and future searches may result in expanded data listings for this specific project investigation.

Definitions of BCD Data Elements:

COUNTYNAME = Tennessee County Name

MANAME = Managed Area Name

QUADNAME = Quad Map Name

SCOMNAME = State Listed, Species Common Name

SITENAME = Site Name for Natural Area, Critical or Sensitive Habitat

SNAME = Species Name

Attachments: (4)

Recently our office assisted your Division with developing Environmental Assessments for various projects. Please note that on February 28, 1996, the U.S. Fish and Wildlife Service published changes to the list of Federal Threatened or Endangered Species, **"Candidate"** species. The most obvious change to this new listing will be the exclusion of many species, formerly "C2" and "3C", from the listing. This change may affect your environmental planning for current or future projects.

Important Notice: The Federal protection status for "Candidate" species, as a candidate for threatened or endangered species listing, has changed as of February 28, 1996. The change of status was published in the **Federal Register, Vol. 61 No. 40, pages 7596-7613**. Additional information concerning these species and the change in status may be obtained by contacting the U.S. Fish and Wildlife Service, in Atlanta GA, @ 404/679-7096.

Status1.doc

HABITAT INFORMATION FOR ENDANGERED SPECIES AND CRITICAL OR SENSITIVE HABITAT FOR LOCATIONS NEAR THE PROJECT SITE AND WITHIN ONE MILE OF THE PROJECT SITE:

The following habitat description has been retrieved from our national data base for the purpose of scientific field review and population determinations. The following species occurrence record is associated with the Tennessee River and the proposed **PPE** for the project.

Spiny River-Snail:
IO FLUVIALIS *Found in shallow waters of shoals that are rapid to moderate and well-oxygenated.**

Note: This species currently does not have any special State or Federal protection status. The species and roost sites are considered significant and are tracked by our Division staff.

Because the habitat for the animal species listed is very specific, you may wish to request further information from our zoologist, Mr. David Withers, in our office in Nashville. He may be reached by telephone at **615/532-0431**.

__Note:__
Should the project require further environmental program permits from our Department, please attach a complete copy of this review or assessment to the permit application.

LIST OF RARE, THREATENED, AND ENDANGERED SPECIES FOR THE KNOX, SHOOKS GAP, & BEARDEN QUADs, TN; DSF/DNH-TDEC PROJECT

08 OCT 1997

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	GLOBAL RANK	STATE RANK
INVERTEBRATES					
ATHEARNIA ANTHONYI	ANTHONY'S RIVER SNAIL	LE	E	G1T1	S1
DROMUS DROMAS	DROMEDARY PEARLYMUSSEL	LE	E	G1	S1
EPIOBLASMA TORULOSA TORULOSA	TUBERCLED BLOSSOM	LE	E	G2TX	SX
FUSCONAIA EDGARIANA	SHINY PIGTOE	LE	E	G1	S1
IO FLUVIALIS	SPINY RIVERSNAIL			G2	S2
LITHASIA GENICULATA	ORNATE ROCKSNAIL			G1G3	S2
LITHASIA VERRUCOSA	VARICOSE ROCKSNAIL			G?	S3
PLETHOBASUS COOPERIANUS	ORANGE-FOOT PIMPLEBACK	LE	E	G1	S1
QUADRULA INTERMEDIA	CUMBERLAND MONKEYFACE	LE	E	G1	S1
PLANTS					
ARABIS PATENS	SPREADING ROCKCRESS		E	G3	S1
AUREOLARIA PATULA	SPREADING FALSE-FOXGLOVE		T	G2G3	S2
CARDAMINE FLAGELLIFERA	RUNNING BITTERCRESS		T	G3	S2
CIMICIFUGA RUBIFOLIA	APPALACHIAN BUGBANE		T	G3	S3
HYDRASTIS CANADENSIS	GOLDENSEAL		S-CE	G4	S3
ONOSMODIUM MOLLE SSP OCCIDENTALE	WESTERN FALSE GROMWELL		T	G4G5T4	S1S2
PANAX QUINQUEFOLIUS	AMERICAN GINSENG		S-CE	G4	S3S4
SAXIFRAGA CAREYANA	CAREY'S SAXIFRAGE		S	G3	S3
VERTEBRATES					
ACCIPITER STRIATUS	SHARP-SHINNED HAWK		D	G5	S2
ANGUILLA ROSTRATA	AMERICAN EEL			G5	S3
CARPIODES VELIFER	HIGHFIN CARPSUCKER		D	G4G5	S3
CRYPTOBRANCHUS ALLEGANIENSIS	HELLBENDER		D	G4	S3
FALCO PEREGRINUS	PEREGRINE FALCON	E/SA	E	G4	S1N
GYRINOPHILUS PALLEUCUS	TENNESSEE CAVE SALAMANDER		T	G2	S2
IXOBRYCHUS EXILIS	LEAST BITTERN		D	G5	S2
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER			G5	S4
MYOTIS GRISESCENS	GRAY BAT	LE	E	G3	S2
NOTURUS FLAVIPINNIS	YELLOWFIN MADTOM	LTXN	E	G1	S1
SOREX LONGIROSTRIS	SOUTHEASTERN SHREW		D	G5	S4
TRACHEMYS SCRIPTA TROOSTII	CUMBERLAND SLIDER			G5T3T4	S3S4
TYTO ALBA	COMMON BARN-OWL		D	G5	S3S4

30 Records Processed

QUADNAME:	SCOMNAME:	SNAME:	FEDERAL	STATE	SRANK:
SHOOKS GAP	TENNESSEE CAVE SALAMANDER	GYRINOPHILUS PALLEUCUS		T	S2
SHOOKS GAP	TENNESSEE CAVE SALAMANDER	GYRINOPHILUS PALLEUCUS		T	S2
SHOOKS GAP	LEAST BITTERN	IXOBRYCHUS EXILIS		D	S2
SHOOKS GAP	SHARP-SHINNED HAWK	ACCIPITER STRIATUS		D	S2
SHOOKS GAP	COMMON BARN-OWL	TYTO ALBA		D	S3S4
SHOOKS GAP	COMMON BARN-OWL	TYTO ALBA		D	S3S4
SHOOKS GAP	AMERICAN EEL	ANGUILLA ROSTRATA			S3
SHOOKS GAP	HIGHFIN CARPSUCKER	CARPIODES VELIFER		D	S3
SHOOKS GAP	DROMEDARY PEARLYMUSSEL	DROMUS DROMAS	LE	E	S1
SHOOKS GAP	DROMEDARY PEARLYMUSSEL	DROMUS DROMAS	LE	E	S1
SHOOKS GAP	SHINY PIGTOE	FUSCONAIA EDGARIANA	LE	E	S1
SHOOKS GAP	ORANGE-FOOT PIMPLEBACK	PLETHOBASUS COOPERIANUS	LE	E	S1
SHOOKS GAP	CUMBERLAND MONKEYFACE	QUADRULA INTERMEDIA	LE	E	S1
SHOOKS GAP	SPINY RIVERSNAIL	IO FLUVIALIS			S2
SHOOKS GAP	VARICOSE ROCKSNAIL	LITHASIA VERRUCOSA			S3
SHOOKS GAP	WESTERN FALSE GROMWELL	ONOSMODIUM MOLLE SSP OCCIDENTALE		T	S1S2
SHOOKS GAP	WESTERN FALSE GROMWELL	ONOSMODIUM MOLLE SSP OCCIDENTALE		T	S1S2
SHOOKS GAP	GOLDENSEAL	HYDRASTIS CANADENSIS		S-CE	S3
KNOXVILLE	HELLBENDER	CRYPTOBRANCHUS ALLEGANIENSIS		D	S3
KNOXVILLE	TENNESSEE CAVE SALAMANDER	GYRINOPHILUS PALLEUCUS		T	S2
KNOXVILLE	PEREGRINE FALCON	FALCO PEREGRINUS	E/SA	E	S1N
KNOXVILLE	COMMON BARN-OWL	TYTO ALBA		D	S3S4
KNOXVILLE	RED-HEADED WOODPECKER	MELANERPES ERYTHROCEPHALUS			S4
KNOXVILLE	YELLOWFIN MADTOM	NOTURUS FLAVIPINNIS	LTXN	E	S1
KNOXVILLE	SOUTHEASTERN SHREW	SOREX LONGIROSTRIS		D	S4
KNOXVILLE	CUMBERLAND SLIDER	TRACHEMYS SCRIPTA TROOSTII			S3S4
KNOXVILLE	CUMBERLAND SLIDER	TRACHEMYS SCRIPTA TROOSTII			S3S4
KNOXVILLE	SIX-LINED RACERUNNER	CNEMIDOPHORUS SEXLINEATUS			S3
KNOXVILLE	SIX-LINED RACERUNNER	CNEMIDOPHORUS SEXLINEATUS			S3
KNOXVILLE	SIX-LINED RACERUNNER	CNEMIDOPHORUS SEXLINEATUS			S3
KNOXVILLE	DROMEDARY PEARLYMUSSEL	DROMUS DROMAS	LE	E	S1
KNOXVILLE	DROMEDARY PEARLYMUSSEL	DROMUS DROMAS	LE	E	S1
KNOXVILLE	DROMEDARY PEARLYMUSSEL	DROMUS DROMAS	LE	E	S1
KNOXVILLE	DROMEDARY PEARLYMUSSEL	DROMUS DROMAS	LE	E	S1
KNOXVILLE	TUBERCLED BLOSSOM	EPIOBLASMA TORULOSA TORULOSA	LE	E	SX
KNOXVILLE	ORANGE-FOOT PIMPLEBACK	PLETHOBASUS COOPERIANUS	LE	E	S1
KNOXVILLE	ORANGE-FOOT PIMPLEBACK	PLETHOBASUS COOPERIANUS	LE	E	S1
KNOXVILLE	ORANGE-FOOT PIMPLEBACK	PLETHOBASUS COOPERIANUS	LE	E	S1
KNOXVILLE	SPINY RIVERSNAIL	IO FLUVIALIS			S2
KNOXVILLE	SPINY RIVERSNAIL	IO FLUVIALIS			S2
KNOXVILLE	ANTHONY'S RIVER SNAIL	ATHEARNIA ANTHONYI	LE	E	S1
KNOXVILLE	ORNATE ROCKSNAIL	LITHASIA GENICULATA			S2
KNOXVILLE	VARICOSE ROCKSNAIL	LITHASIA VERRUCOSA			S3
KNOXVILLE	AMERICAN GINSENG	PANAX QUINQUEFOLIUS		S-CE	S3S4
KNOXVILLE	AMERICAN GINSENG	PANAX QUINQUEFOLIUS		S-CE	S3S4
KNOXVILLE	AMERICAN GINSENG	PANAX QUINQUEFOLIUS		S-CE	S3S4
KNOXVILLE	SPREADING ROCKCRESS	ARABIS PATENS		E	S1
KNOXVILLE	RUNNING BITTERCRESS	CARDAMINE FLAGELLIFERA		T	S2
KNOXVILLE	APPALACHIAN BUGBANE	CIMICIFUGA RUBIFOLIA		T	S3
KNOXVILLE	GOLDENSEAL	HYDRASTIS CANADENSIS		S-CE	S3
KNOXVILLE	GOLDENSEAL	HYDRASTIS CANADENSIS		S-CE	S3
KNOXVILLE	CAREY'S SAXIFRAGE	SAXIFRAGA CAREYANA		S	S3
KNOXVILLE	CAREY'S SAXIFRAGE	SAXIFRAGA CAREYANA		S	S3
KNOXVILLE	CAREY'S SAXIFRAGE	SAXIFRAGA CAREYANA		S	S3
KNOXVILLE	CAREY'S SAXIFRAGE	SAXIFRAGA CAREYANA		S	S3

QUADNAME:	SCOMNAME:	SNAME:	FEDERAL	STATE	SRANK:
KNOXVILLE	CAREY'S SAXIFRAGE	SAXIFRAGA CAREYANA		S	S3
KNOXVILLE	SPREADING FALSE-FOXGLOVE	AUREOLARIA PATULA		T	S2
BEARDEN	HELLBENDER	CRYPTOBRANCHUS ALLEGANIENSIS		D	S3
BEARDEN	TENNESSEE CAVE SALAMANDER	GYRINOPHILUS PALLEUCUS		T	S2
BEARDEN	RED-HEADED WOODPECKER	MELANERPES ERYTHROCEPHALUS			S4
BEARDEN	SOUTHEASTERN SHREW	SOREX LONGIROSTRIS		D	S4
BEARDEN	SOUTHEASTERN SHREW	SOREX LONGIROSTRIS		D	S4
BEARDEN	GRAY BAT	MYOTIS GRISESCENS	LE	E	S2

63 Records Processed

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
401 Church Street
Nashville, Tennessee 37243

MEMORANDUM

DATE: October 6, 1997

TO: Andrew Barrass, Environmental Review Coordinator

FROM: David Duhl, Manager DD
Tennessee Rivers Assessment Program

RE: Data Request for Smoky Mountain Smelter Site

A review of our database indicates that no information has been collected for surface waters in the area of interest.

Please let us know if we can be of help in a future request.

Federal Status Definitions of Tennessee's Rare Plants and Animals

Federally listed species are protected by the Endangered Species Act of 1973 (as amended) and the list is administered and determined by the US Fish and Wildlife Service.

E/SA - Endangered by similarity of appearance.

LE - **Listed Endangered**, the taxon is threatened by extinction throughout all or a significant portion of its range.

LT - **Listed Threatened**, the taxon is likely to become an endangered species in the foreseeable future.

PE - **Proposed Endangered**, the taxon is proposed for listing as endangered.

PT - **Proposed Threatened**, the taxon is proposed to be listed as threatened.

Y - **Synonyms**

C - **Candidate Species**, These 'Candidate' species are not currently proposed for listing, but development and publication of proposed rules for such candidate species is anticipated. The US Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species. The US Fish and Wildlife Service will determine the relative listing priority of these candidate species, and encourages other agencies, groups and individuals to give consideration to these taxa in environmental planning.

C2 - DESIGNATION DISCONTINUED
C3 - DESIGNATION DISCONTINUED
- 3A - DESIGNATION DISCONTINUED
- 3B - DESIGNATION DISCONTINUED
- 3C - DESIGNATION DISCONTINUED

__NL - status varies for different populations or parts of range with at least one part not listed.

__XN - non-essential experimental population

__XE - essential experimental population

(Modified From Federal Register, 50 CFR Part 17, Feb. 28, 1996, Vol. 61, No. 40, pp. 7596 - 7613.)

Note: The taxa listed as candidate species may be added to the list of Endangered and Threatened plants and animals, and, as such, consideration should be given them in environmental planning. Taxa listed as LE, LT, PE and PT must be given consideration in environmental planning involving federal funds, lands, or permits, and should be given consideration in all non-federal activities. For further information contact the Region 4, Endangered Species Coordinator, at the US Fish and Wildlife Service, 1875 Century Boulevard, Atlanta, Georgia 30345, phone (404)679-7096; or an Endangered Species Specialist at the US Fish and Wildlife Service, 446 Neal Street, Cookeville, Tennessee 38501, phone (615)528-6481.

State Status Definitions of Tennessee's Rare Plants

State Status indicates which plants are formally listed as state Endangered, Threatened, or Special Concern under the authority of the Tennessee Department of Environment and Conservation. The Department has the valuable assistance of the State's best field botanists, twelve of whom serve on the Scientific Advisory Committee which periodically reviews the list.

E - **Endangered Species** means any species or subspecies of plant whose continued existence as a viable component of the state's flora is determined by the Commissioner to be in jeopardy, including but not limited to all species of plants determined to be "endangered species" pursuant to the Endangered Species Act.

PE - **Proposed Endangered** means any species or subspecies of plant nominated by the Scientific Advisory Committee to be added to the list of Tennessee's Endangered Species. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become Endangered Species.

T - **Threatened Species** means any species or subspecies of plant which appears likely, within the foreseeable future, to become endangered throughout all or a significant portion of its range in Tennessee, including but not limited to all species of plants determined to be a "threatened species" pursuant to the Endangered Species Act.

S - **Special Concern Species** means any species or subspecies of plant which is uncommon in Tennessee, or has unique or highly specific habitat requirements or scientific value and therefore requires careful monitoring of its status.

State Status Modifiers follow State Status abbreviations.

P - **Possibly Extirpated**, species or subspecies that have not been seen in Tennessee for the past 20 years. May no longer occur in Tennessee.

CE - **Commercially Exploited**, due to large numbers being taken from the wild and propagation or cultivation insufficient to meet market demand. These plants are of long-term conservation concern, but the Division of Natural Heritage does not recommend they be included in the normal environmental review process.

(Adapted from Somers, Paul. 1989. Revised List of the Rare Plants of Tennessee. Journal of the Tennessee Academy of Sciences, 64(3): 179-184., and Rules of Tennessee Division of Ecological Services, Chap. 0400-6-2, Rare Plant Protection and Conservation Regulations.)

State Status Definitions of Tennessee's Rare Wildlife

State Status indicates which animals are formally listed as state endangered or threatened under the authority of the Tennessee Wildlife Resources Agency (T.C.A. 70-8-104, 70-8-105, and 70-8-107).

E - **Endangered**- any species or subspecies of wildlife whose prospects of survival or recruitment within the state are in jeopardy or are likely within the foreseeable future to become so due to any of the following factors:

- (a) The destruction, drastic modification, or severe curtailment of its habitat;
- (b) Its overutilization for scientific, commercial or sporting purposes;
- (c) The effect on it of disease, pollution, or predation;
- (d) Other natural or man-made factors affecting its prospects of survival or recruitment within the state; or
- (e) Any combination of the foregoing factors.

T- **Threatened**- any species or subspecies of wildlife which is likely to become an endangered species within the foreseeable future.

D - **Deemed in Need of Management**- any species or subspecies of nongame wildlife which the executive director of the TWRA believes should be investigated in order to develop information relating to population, distribution, habitat, needs, limiting factors, and other biological and ecological data to determine management measures necessary for their continued ability to sustain themselves successfully.

Species with no State Status designation are considered rare in the state by the Division of Natural Heritage. Information is collected on these species in order to minimize their formal listing as Endangered or Threatened.

NOTE: For further information contact the Tennessee Wildlife Resources Agency (TWRA) at (615)781-6670, or the Division of Natural Heritage at (615)532-0431. The USFWS has prime responsibility for federal status assignment and enforcement and protection of federally listed species. TWRA has responsibility for state status and enforcement and protection of state listed species.

State Rank Definitions of Tenn

As a supplement to the official State and Federal status (Tennessee Department of Environment & Conservation) determined using methodology developed by The Nature Cons based upon known occurrences of rare animals and published upon the best available information, with all State Ranks bein which have neither federal nor state protected status are track Rank. In particular, these include species which are state end are facing particular threats, and for which neither state nor f Ranks are defined as follows:

S1 = Critically imperiled in the state because of extreme rari vulnerable to extirpation from the state (Typically 5 or fewer occ

S2 = Imperiled in the state because of rarity or because of so from the state (6 to 20 occurrences or few remaining individual

S3 = Rare and uncommon in the state (21 to 100 occurrences

S4 = Widespread, abundant, and apparently secure in stat (Usually more than 100 occurrences).

S5 = Demonstrably widespread, abundant, and secure in under present conditions.

SA = Accidental: Accidental or casual in the state (i.e., infrequ
SH = Historical: Occurred historically in the state, and suspect
SP = Potential: Potential that the species occurs in the state, b

SR = Reported: Reported in the state but without conclusive accepting or rejecting (e.g., misidentified specimen) the rep Divison of Natural Heritage does not have data to allow accurat

SSYN = Synonym: Reported from the state, but has been sync

SU = Unrankable: Possibly in peril in the state, but status unc
SX = Extirpated: Believed to be extirpated from the state.

S#S# = Numeric range rank: A range between two of the nun
S? = Unranked: Species not yet ranked in the state.

HYB = Hybrid: Taxon represents a hybrid between species.

B = Breeding: Considered a breeding population within the st
N = Non-breeding: Considered a non-breeding population wit
? = Inexact or uncertain rank.

Note: DNH has responsibility for assigning state ranks state endemics, and species with **limited distribution** in Ten environmental planning. For further information contact DNH

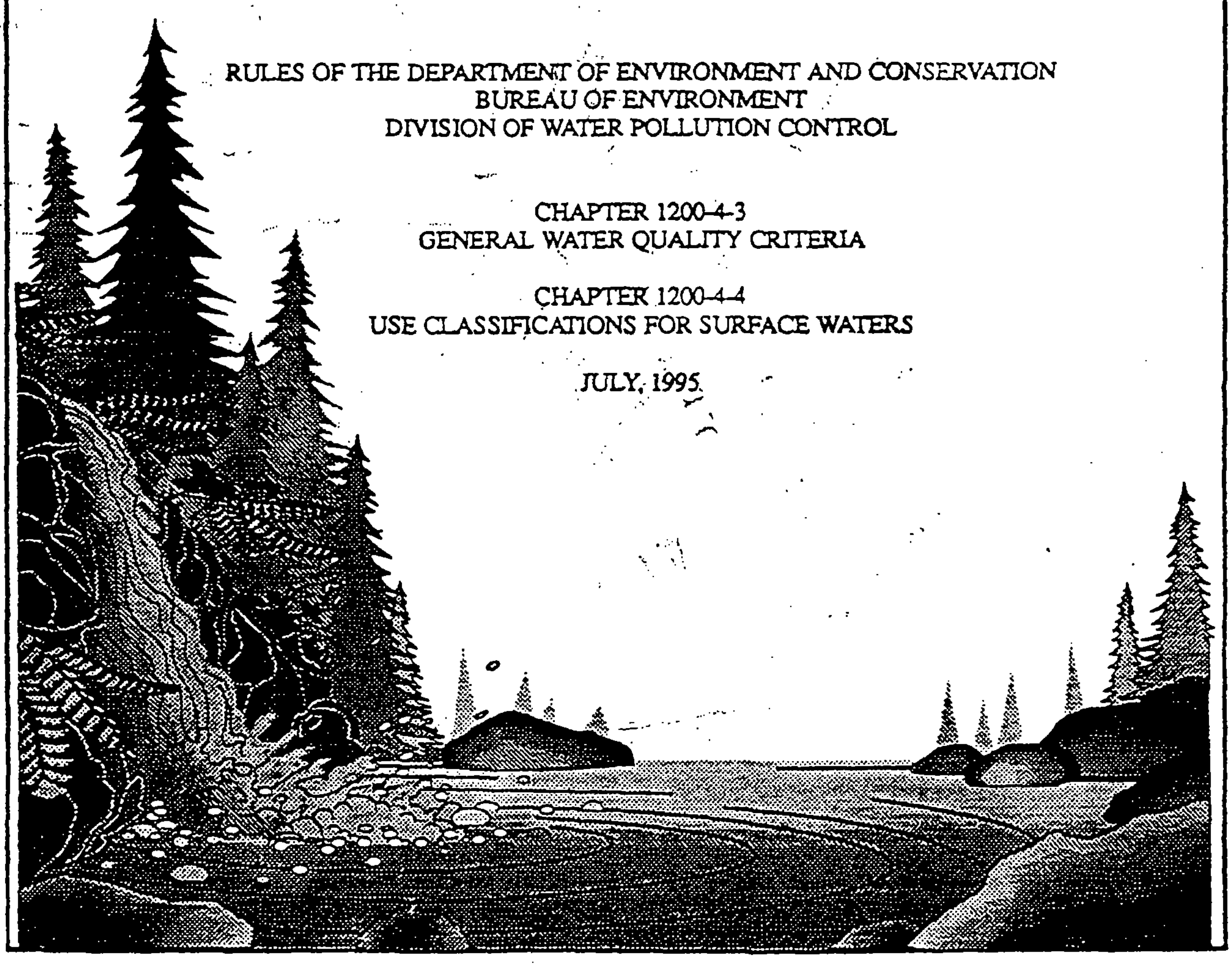
" Use Classifications for Surface Waters "

TDEC/Division of Water Pollution Control. 1995. *State of Tennessee Water Quality Standards*, Chapter 1200-4-4, Use Classifications for Surface Waters. July. pp:354-6.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

STATE OF TENNESSEE
WATER QUALITY STANDARDS



RULES OF THE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
BUREAU OF ENVIRONMENT
DIVISION OF WATER POLLUTION CONTROL

CHAPTER 1200-4-3
GENERAL WATER QUALITY CRITERIA

CHAPTER 1200-4-4
USE CLASSIFICATIONS FOR SURFACE WATERS

JULY, 1995

(8) Upper Tennessee River Basin (cont.)

STREAM	DESCRIPTION	DOMESTIC WATER SUPPLY	INDUST WATER SUPPLY	FISH & AQUATIC LIFE	RECRE-ATION	IRRIG-ATION	LIVESTOCK WATERING & WILDLIFE	NAVIG-ATION	TROUT STREAM	NATURALLY REPRODUCING TROUT STREAM
Stony Branch	Mile 0.0 to Origin			X	X	X	X		X	
Arbutus Branch	Mile 0.0 to Origin			X	X	X	X		X	
Mill Creek	Mile 0.0 to Origin			X	X	X	X			X
Forge Creek	Mile 0.0 to Origin			X	X	X	X			X
Coalen Ground Br	Mile 0.0 to Origin			X	X	X	X		X	
Bower Creek	Mile 0.0 to Origin			X	X	X	X		X	
Tipton Sugar Cove	Mile 0.0 to Origin			X	X	X	X		X	
Ekanneetlee Br	Mile 0.0 to Origin			X	X	X	X		X	
Tater Branch	Mile 0.0 to Origin			X	X	X	X		X	
McCaulley Branch	Mile 0.0 to Origin			X	X	X	X		X	
Rowans Branch	Mile 0.0 to Origin			X	X	X	X		X	
Anthony Creek	Mile 0.0 to Origin			X	X	X	X			X
Shop Creek	Mile 0.0 to Origin			X	X	X	X		X	
Tabcat Creek	Mile 0.0 to Origin			X	X	X	X		X	
Parson Branch	Mile 0.0 to Origin			X	X	X	X			X
Bible Creek	Mile 0.0 to Origin			X	X	X	X		X	
Slickrock Creek	Tennessee portion			X	X	X	X			X
Little Slickrock Cr	Mile 0.0 to Origin			X	X	X	X			X
Little Tennessee River	Mile 30.0 to 49.7 (TN-N.C. Line)	X	X	X	X	X	X		X	
Morgan Branch	Mile 0.0 to 0.8			X	X	X	X			
Morgan Branch	Mile 0.8 to 1.0			X	X	X	X			
Morgan Branch	Mile 1.0 to Origin			X	X	X	X			
Abrams Branch	Mile 0.0 to Origin			X	X	X	X			
First Creek	Mile 0.0 to Origin	X	X	X	X	X	X			
Tennessee River	Mile 601.1 to 636.6 (Little River)	X	X	X	X	X	X	X		
Town Creek	Mile 0.0 to Origin			X	X	X	X			
Gallagher Creek	Mile 0.0 to 3.3			X	X	X	X			
Gallagher Creek	Mile 3.3 to 3.5			X	X	X	X			
Gallagher Creek	Mile 3.5 to Origin			X	X	X	X			
Turkey Creek	Mile 0.0 to Origin			X	X	X	X			
Sinking Creek #1	Mile 0.0 to Origin	X	X	X	X	X	X			
Ten Mile Creek	From Sink to Origin			X	X	X	X			
Sinking Creek #2	Mile 0.0 to 0.7			X	X	X	X			
Sinking Creek #2	Mile 0.7 to 0.8			X	X	X	X			
Unnamed Trib	Mile 0.0 to 0.1			X	X	X	X			
Unnamed Trib	Mile 0.1 to Origin			X	X	X	X			
Sinking Creek #2	Mile 0.8 to Origin			X	X	X	X			
Lackey Creek	Mile 0.0 to Origin			X	X	X	X			
Unnamed Branch	Mile 0.0 to 0.5			X	X	X	X			
Unnamed Branch	Mile 0.5 to 0.7			X	X	X	X			
Unnamed Branch	Mile 0.7 to Origin			X	X	X	X			
Little River	Mile 0.0 to 33.0	X	X	X	X	X	X			
Polecat Branch	Mile 0.0 to 0.7			X	X	X	X			
Polecat Branch	Mile 0.7 to 0.8			X	X	X	X			
Polecat Branch	Mile 0.8 to Origin			X	X	X	X			
Stock Creek	Mile 0.0 to 3.2			X	X	X	X			
Stock Creek	Mile 3.2 to 3.4			X	X	X	X			
Stock Creek	Mile 3.4 to Origin			X	X	X	X			
McCall Branch	Mile 0.0 to 1.3			X	X	X	X			
McCall Branch	Mile 1.3 to 1.5			X	X	X	X			
McCall Branch	Mile 1.5 to Origin			X	X	X	X			
Russell's Branch	Mile 0.0 to Origin			X	X	X	X			

(8) Upper Tennessee River Basin (cont)

STREAM	DESCRIPTION	DOMESTIC WATER SUPPLY	INDUST WATER SUPPLY	FISH & AQUATIC LIFE	RECRE-ATION	IRRIG-ATION	LIVESTOCK WATERING & WILDLIFE	NAVIG-ATION	TROUT STREAM	NATURALLY REPRODUCING TROUT STREAM
Pistol Creek	Mile 0 0 to 0 1			X	X	X	X			
Pistol Creek	Mile 0 1 to 2 5			X	X	X	X			
Duncan Branch	Mile 0 0 to Origin			X	X	X	X			
Pistol Creek	Mile 2 5 to 6 6			X	X	X	X			
Culton Creek	Mile 0 0 to 0 4			X	X	X	X			
Tedford Br	Mile 0 0 to 0 4			X	X	X	X			
Tedford Br	Mile 0 4 to Origin			X	X	X	X			
Culton Creek	Mile 0 4 to Origin			X	X	X	X			
Pistol Creek	Mile 6 6 to 7 7			X	X	X	X			
Pistol Creek	Mile 7 7 to 8 0			X	X	X	X			
Pistol Creek	Mile 8 0 to 11 4			X	X	X	X			
Pistol Creek	Mile 11 4 to Origin			X	X	X	X			
Hesse Creek	Upper 5 miles			X	X	X	X		X	
Cane Creek	Upper 2 0 miles			X	X	X	X		X	
Beard Cane Cr	Upper 1 5 miles			X	X	X	X		X	
Little River	Mile 33 0 to Origin	X		X	X	X	X			X
M Pr Little River	Mile 0 0 to Origin			X	X	X	X			X
W Prong Little R	Mile 0 0 to Origin			X	X	X	X		X	
Laurel Creek	Mile 0 0 to Origin			X	X	X	X		X	
Meadow Br	Mile 0 0 to Origin			X	X	X	X		X	
Spruce Flats Br	Mile 0 0 to Origin			X	X	X	X		X	
Sams Creek	Mile 0 0 to Origin			X	X	X	X		X	
Thunderhead Pr	Mile 0 0 to Origin			X	X	X	X		X	
Shut-in Cr	Mile 0 0 to Origin			X	X	X	X		X	
Lynn Camp Prong	Mile 0 0 to Origin			X	X	X	X		X	
Marks Creek	Mile 0 0 to Origin			X	X	X	X		X	
Meigs Creek	Mile 0 0 to Origin			X	X	X	X		X	
Little Greenbriar Creek	Mile 0 0 to Origin			X	X	X	X		X	
Mannis Branch	Mile 0 0 to Origin			X	X	X	X		X	
Blanket Creek	Mile 0 0 to Origin			X	X	X	X		X	
Shields Branch	Mile 0 0 to Origin			X	X	X	X		X	
Jakes Creek	Mile 0 0 to Origin			X	X	X	X		X	
Newt Prong	Mile 0 0 to Origin			X	X	X	X		X	
Laurel Branch	Mile 0 0 to Origin			X	X	X	X		X	
Fish Camp Prong	Mile 0 0 to Origin			X	X	X	X		X	
Goshen Prong	Mile 0 0 to Origin			X	X	X	X		X	
Silers Prong	Mile 0 0 to Origin			X	X	X	X		X	
Rich Branch	Mile 0 0 to Origin			X	X	X	X		X	
Rough Creek	Mile 0 0 to Origin			X	X	X	X		X	
Meigs Post Prong	Mile 0 0 to Origin			X	X	X	X		X	
Grouse Creek	Mile 0 0 to Origin			X	X	X	X		X	
Tennessee River	Mile 636 6 to 638 6	X	X	X	X	X	X	X		
Tennessee River	Mile 638 6 to 640 0		X	X	X	X	X	X		
Tennessee River	Mile 640 0 to 643 4	X	X	X	X	X	X	X		
Tennessee River	Mile 643 4 to 646 4		X	X	X	X	X	X		
Tennessee River	Mile 646 4 to 652 2	X	X	X	X	X	X	X		
Knob Creek	Mile 0 0 to Origin			X	X	X	X			
Flenniken Branch	Mile 0 0 to Origin			X	X	X	X			
Unnamed Branch	Mile 0 0 to 0 1			X	X	X	X			
Unnamed Branch	Mile 0 1 to Origin			X	X	X	X			
Unnamed Branch	Mile 0 0 to 1 1			X	X	X	X			
Unnamed Branch	Mile 1 1 to 1 3			X	X	X	X			
Unnamed Branch	Mile 1 3 to Origin			X	X	X	X			
Fourth Creek	Mile 0 0 to Origin			X	X	X	X			
Third Creek	Mile 0 0 to 4 9			X	X	X	X			

(8) Upper Tennessee River Basin (cont.)

STREAM	DESCRIPTION	DOMESTIC WATER SUPPLY	INDUST WATER SUPPLY	FISH & AQUATIC LIFE	RECRE-ATION	IRRIG-ATION	LIVESTOCK WATERING & WILDLIFE	NAVIG-ATION	TROUT STREAM	NATURALLY REPRODUCING TROUT STREAM
Third Creek	Mile 4 9 to Origin	X	X	X	X	X	X			
Second Creek	Mile 0 0 to Origin		X	X	X	X	X			
First Creek	Mile 0 0 to Origin			X	X	X	X			
All other surface water named and unnamed in the Upper Tennessee River Basin, with the exception of wet weather conveyances, which have not been specifically noted shall be classified				X	X	X	X			

(9) Clinch River Basin

STREAM	DESCRIPTION	DOMESTIC WATER SUPPLY	INDUST WATER SUPPLY	FISH & AQUATIC LIFE	RECRE-ATION	IRRIG-ATION	LIVESTOCK WATERING & WILDLIFE	NAVIG-ATION	TROUT STREAM	NATURALLY REPRODUCING TROUT STREAM
Clinch River	Mile 0 0 to 4 4 (Emory River)	X	X	X	X	X	X	X		
Emory River	Mile 0 0 to Origin	X	X	X	X	X	X			
Little Emory River	Mile 0 0 to Origin	X	X	X	X	X	X			
Middle Fork Little Emory River	Mile 0 0 to Origin			X	X	X	X			
Davis Branch	Mile 0 0 to 0 2			X	X	X	X			
Unnamed Tributary	At Emory River (Mile 16 4), Mile 0 0 to 1 0			X	X	X	X			
Crooked Fork Creek	Mile 0 0 to 4 9			X	X	X	X			
Unnamed Tributary	At Crooked Fork Creek (Mile 4 9), Mile 0 0 to Origin			X	X	X	X			
Crooked Fork Creek	Mile 4 9 to 6 7	X		X	X	X	X			
Flat Fork Creek	Mile 0 0 to Origin	X		X	X	X	X			
Unnamed Tributary	At Flat Fork (Mile 2 3), Mile 0 0 to Origin			X	X	X	X			
Crooked Fork Creek	Mile 6 7 to Origin	X		X	X	X	X			
Stockstill Creek	Mile 0 0 to 0 4			X	X	X	X			
Stockstill Creek	Mile 0 4 to Origin			X	X	X	X			
Obed River	Mile 0 0 to 34 6			X	X	X	X			
Daddy's Creek	Mile 0 0 to Origin			X	X	X	X			
Basses Creek	Mile 0 0 to 6 0			X	X	X	X			
Basses Creek	Mile 6 0 to 6 2			X	X	X	X			
Basses Creek	Mile 6 2 to Origin			X	X	X	X			
Fox Creek	Mile 0 0 to Origin			X	X	X	X			
Scantling Branch	Mile 0 0 to 1 0			X	X	X	X			
Scantling Branch	Mile 1 0 to 1 2			X	X	X	X			
Unnamed Trib	At Scantling Branch (Mile 1 2) Mile 0 0 to Origin			X	X	X	X			
Scantling Branch	Mile 1 2 to Origin			X	X	X	X			
Unnamed Tributary	At Obed River (Mile 34 6), Mile 0 0 to 0 2			X	X	X	X			
Unnamed Tributary	Mile 0 2 to Origin			X	X	X	X			
Obed River	Mile 34 6 to 38 6			X	X	X	X			
Obed River	Mile 38 6 to 40 1			X	X	X	X			
Obed River	Mile 40 1 to Origin	X	X	X	X	X	X			
Unnamed Tributary	At Obed River (Mile 45 4), Mile 0 0 to Origin			X	X	X	X			
Clinch River	Mile 4 4 to 12 0 (Poplar Creek)	X	X	X	X	X	X	X		
Poplar Creek	Mile 0 0 to 0 5		X	X	X	X	X			
Poplar Creek	Mile 0 5 to 1 3			X	X	X	X			
Poplar Creek	Mile 1 3 to 5 5			X	X	X	X			
East Fork Poplar Creek	Mile 0 0 to 4 8			X	X	X	X			
Bear Creek	Mile 0 0 to Origin			X	X	X	X			
East Fork Poplar Creek	Mile 4 8 to 8 3			X	X	X	X			
East Fork Poplar Creek	Mile 8 3 to Dam at AEC Y-12			X	X	X	X			
Poplar Creek	Mile 5 5 to 12 4			X	X	X	X			

" Tennessee Fishing Advisories "

TDEC/Division of Water Pollution Control. 1996. Tennessee Fishing Advisories. Tennessee Department of Environment and Conservation. March 1992, revised May 1996.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

Why does the Department of Environment and Conservation issue advisories?

Tennessee issues advisories because, based on the best available research, there is an increased risk of cancer or other serious illness when concentrations of toxic materials exceed levels of concern. Children may be particularly vulnerable to these effects. The purpose of advisories is to give people the information they need so they can make informed choices.

Two types of fish advisories are issued. A **precautionary advisory**, the mildest form of advisory, warns children, pregnant women, and nursing mothers to avoid consumption of the type fish affected. All others are warned to limit consumption to 1.2 pounds per month.

A **no consumption advisory** warns the public to avoid eating a type of fish in any amount. In extreme cases, the Tennessee Wildlife Resources Agency can establish and enforce a sport or commercial fishing ban.

How do I know which areas are affected?

When the Department issues an **advisory** on a stream or lake, a press release concerning the nature of the health risk is issued. In most cases, signs warning the dangers of public use are placed at highly used access points. The Tennessee Wildlife Resources Agency also prints a list of the Department's advisories in the annual fishing regulations brochure.

If you are planning a fishing trip and have additional questions concerning advisories, feel free to call the Division of Water Pollution Control central office in Nashville (615-741-6623) or the field office in the area you are planning to fish. These telephone numbers

Nashville Central Office:	- (615) 532 - 0699
Field Offices:	
Johnson City	- (423) 854 - 5400
Knoxville	- (423) 594 - 6035
Chattanooga	- (423) 634 - 5745
Nashville	- (615) 650 - 7240
Jackson	[illegible]

What is the risk of eating fish where fishing advisories have been issued?

The risk of occasionally eating fish from one of these areas is small. Since cancer risk occurs over a lifetime of exposure, a few fish over a course of several years will not measurably increase your risk. However, children may be more susceptible to these materials and it is advised that children, pregnant women, and nursing mothers not eat fish from streams and lakes where a **precautionary advisory** or a **no consumption advisory** has been issued.

The risk can be reduced by taking a few simple precautions. Since these toxic materials are often associated with sediments, gamefish such as bass, bluegill, and crappie typically contain lower levels than do bottom-dwelling fish such as carp or catfish.

Although everybody likes to catch big fish, it's a simple fact that big fish tend to have higher levels of these materials than do smaller fish, because big fish are older and have had more time to accumulate toxic chemicals. Do not keep fish that appear to be in poor health.

Since these materials accumulate in fatty tissues, when cleaning your catch, fish should be filleted and the skin removed. The belly flap and fatty strip along the backbone and lateral line should be discarded. Broiling, baking, or grilling fish provides additional risk reduction.

Contaminants are typically found in sediment and fish tissue and not in measurable levels in water. Treated water from these areas is certainly safe to drink. Swimming in these waters does not pose any additional health risk.

Authorization Number 327365, 4,000 copies. This public document was promulgated at a cost of 7 cents per copy. March, 1992

TENNESSEE FISHING ADVISORIES

MARCH 1992

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF WATER POLLUTION CONTROL
~~150 NINTH AVENUE, NORTH~~
[redacted]

~~(615) 741-6623~~

WATER POLLUTION CONTROL
6th FLOOR L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN [illegible]

The Tennessee Department of Environment and Conservation is responsible for monitoring lakes and streams for toxic materials and for keeping the public informed about areas where sampling has shown that fish are affected.

The U.S. Food and Drug Administration and the U.S. Environmental Protection Agency determine acceptable levels of toxic chemicals in fish. Fortunately, most of Tennessee's fish are significantly below levels of concern and are safe to eat. There are currently 15 streams where fish tissue samples are known to be above levels of concern (see Table).

Fish contamination in many cases comes from a class of chemicals called polychlorinated biphenyls or PCBs. These chemicals were widely used in industrial and commercial equipment until their ban in 1976. Because of widespread use and their tendency to accumulate in fatty tissue, PCBs are routinely detected in fish samples from around the world. Although PCB levels are higher in lakes below large cities and other areas where extensive electrical equipment is used, the wind has also spread this chemical to remote lakes and streams.

Several streams are impacted by chlordane, a pesticide manufactured in Tennessee and, until recently, widely used around houses for termite control. One stream, the Pigeon River in East Tennessee, has been posted because of the presence of dioxin. Dioxin is not thought to be a widespread problem in Tennessee.

Two streams have been posted because of high levels of metals, including mercury.

The levels of toxic materials should be decreasing. Since the manufacture of the most dangerous of these chemicals has been halted and the others strictly regulated, levels should be decreasing nationwide. However, since these chemicals are often very stable and persistent and the levels found so small, it is not yet possible to confirm a decrease in our lakes and streams. Changes in levels of toxic materials will be more apparent from decade to decade than from year to year.

The Department of Environment and Conservation is committed to continue monitoring our lakes and streams and to keep the public

CURRENT FISH TISSUE ADVISORIES (February, 1992, This list subject to revision.)

STREAM	COUNTY	PORTION	POLLUTANT	TYPE ADVISORY
Loosahatchie River	Shelby	Mile 0.0-20.9	Chlordane	Fish should not be consumed.
Wolf River	Shelby	Mile 0.0-18.9	Chlordane	Fish should not be consumed.
Mississippi River	Shelby	MS line to mile 745	Chlordane	Fish should not be consumed. Commercial fishing ban.
McKellar Lake and Nonconnah Creek	Shelby	Mile 0.0 to 1.8. at Horn Lake Road bridge	Chlordane	Fish should not be consumed.
Boone Reservoir	Sullivan, Washington	Entirety	PCBs, chlordane	Precautionary advisory for carp and catfish.*
North Fork Holston River	Sullivan, Hawkins	Mile 0.0-6.2 TN/VA line	Mercury	Fish should not be consumed.
Woods Reservoir	Franklin	Entirety	PCBs	Catfish should not be consumed.
East Fork of Poplar Creek (incl. embayment)	Anderson, Roane	Mile 0.0 - 15.0	Mercury, metals, org. chemicals	Fish should not be consumed. Avoid contact with water.
Fort Loudoun Reservoir	Loudon, Knox, Blount	Entirety (46 miles)	PCBs	Commercial fishing for catfish prohibited. Catfish, largemouth bass over two pounds, and largemouth bass from the Little River embayment should not be consumed.
Tellico Lake	Loudon	Entirety	PCBs	Catfish should not be consumed.
Pigeon River	Cocke	N. Carolina line to Douglas Res.	Dioxin	Fish should not be consumed.
Watts Bar Reservoir	Roane, Meigs, Rhea, Loudon	Tennessee River portion	PCBs	Catfish, striped bass, and hybrid striped bass-whitebass should not be consumed. Precautionary advisory* for whitebass, sauger, carp, smallmouth buffalo and largemouth bass.
	Roane, Anderson	Clinch River arm	PCBs	Striped bass should not be consumed. Precautionary advisory for catfish and sauger*.
Melton Hill Reservoir	Knox, Anderson	Entirety	PCBs	Catfish should not be consumed.
Chattanooga Creek	Hamilton	Mouth to GA line	PCBs, chlordane	Fish should not be consumed. Avoid contact with water.
Nickajack Reservoir	Hamilton, Marion	Entirety	PCBs	Precautionary advisory for catfish*.

* Precautionary Advisory - Children, pregnant women, and nursing mothers should not consume the fish species named. All other persons should limit consumption of the named species to 1.2 pounds per month.

CURRENT FISH TISSUE ADVISORIES (May, 1996, This list subject to revision.)

STREAM	COUNTY	PORTION	POLLUTANT	COMMENTS
Loosahatchie River	Shelby	Mile 0.0 - 20.9	Chlordane	Fish should not be consumed.
Wolf River	Shelby	Mile 0.0 - 18.9	Chlordane	Fish should not be consumed
Mississippi River	Shelby	MS line to mile 745	Chlordane	Fish should not be consumed. Commercial fishing ban.
McKellar Lake & Nonconnah Creek	Shelby	Mile 0.0 to 1.8	Chlordane	Fish should not be consumed. Advisory ends at Horn Lake Road bridge.
North Fork Holston River	Sullivan, Hawkins	Mile 0.0 - 6.2	Mercury	Fish should not be consumed. Advisory goes to TN/VA line.
East Fork of Poplar Creek (incl. embayment)	Anderson, Roane	Mile 0.0 - 15.0	Mercury, PCBs	Fish should not be consumed. Avoid contact with water also.
Chattanooga Creek	Hamilton	Mouth to GA line	PCBs, chlordane	Fish should not be consumed. Avoid contact with water also.
Woods Reservoir	Franklin	Entirety	PCBs	Catfish should not be consumed.
Fort Loudoun Reservoir	Loudon, Knox, Blount	Entirety (46 miles)	PCBs	Commercial fishing for catfish prohibited. Catfish, largemouth bass over two pounds, & any largemouth bass from the Little River embayment should not be consumed.
Tellico Lake	Loudon	Entirety	PCBs	Catfish should not be consumed.
Melton Hill Reservoir	Knox, Anderson	Entirety	PCBs	Catfish should not be consumed.
Watts Bar Reservoir	Roane, Meigs, Rhea, Loudon	Tn River portion	PCBs	Catfish, striped bass, & hybrid striped bass-white bass should not be consumed. Precautionary advisory* for whitebass, sauger, carp, smallmouth buffalo and largemouth bass.
Watts Bar Reservoir	Roane, Anderson	Clinch River arm	PCBs	Striped bass should not be consumed. Precautionary advisory for catfish and sauger.*
Boone Reservoir	Sullivan, Washington	Entirety	PCBs, chlordane	Precautionary advisory for carp and catfish.*
Nickajack Reservoir	Hamilton, Marion	Entirety	PCBs	Precautionary advisory for catfish.*
Pigeon River	Cocke	N. Carolina line to Douglas Res.	Dioxin	Precautionary advisory for carp, catfish, and redbreast sunfish.*

*Precautionary Advisory - Children, pregnant women, and nursing mothers should not consume the fish species named. All other persons should limit consumption of the named species to 1.2 pounds per month.

REFERENCE

" Water Wells on the Knoxville Quadrangle "

TDEC/DWS. 1997a. Records of Water Wells on the Knoxville Quadrangle (0147NW) TN. November 12. pp.:13-23.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NW 1	09300190	RIDENOUR R.B.	07/01/1965	102	8	38		GOOD	- -		00076
KNOX		RACOON VALLEY	/ /	20	--	STEEL	-- - --		- -		HOME
0147NW 1	09301793	(b) (6)	12/12/1983	625	4	83	OPEN	OTHR	- -		00383
KNOX		GAP	/ /	160	117	STEEL	83 - 625		- -	Y	HOME
0147NW 1	09301999	CHANDLER_GREENS	08/20/1987	385	200	86	OPEN	GOOD	- -		00077
KNOX		WILSON	/ /	256	70	STEEL	86 - 385		- -	Y	IRR
0147NW 1	90000471	KNOXVILLE_RACQU	01/23/1989	750	5	1239	OPEN	OTHR	- -		00385
KNOX		LONAS	/ /	268	13	STEEL	124 - 750		- -	Y	IRR
0147NW 1	93002882	(b) (6)	07/14/1993	185	10	24	OPEN	UNK	- -		00684
KNOX		I DUMER DR	/ /	65	60	STEEL	29 - 185		- -	Y	HOME
0147NW 1	93004741	(b) (6)	10/14/1993	182	12	65	OPEN	OTHR	35-50-19	F	00385
BLOUNT		TARKIN VALLEY R	4/18/1994	90	30	STEEL	65 - 182	005632	83-51-59	Y	HOME
0147NW 2	09300015	STANLES KNITTING MI	10/17/1963	500	130	19			35-57-43	S	00152
KNOX			/ /	200	30	STEEL	-- - --		83-55-21		IND
0147NW 2	09300167	(b) (6)	05/15/1965	415	13	30		GOOD	- -		00076
KNOX		THOMAS WEAVER	/ /	400	--	STEEL	-- - --		- -		HOME
0147NW 2	09301679	KNOXVILLE_____CITY	12/17/1981	197	--	72	OPEN	GOOD	35-57-44	S	00383
KNOX		EXPO SITE/CLINC	10/11/1983	85	27	STEEL	72 - 197		83-55-25	Y	COMM
0147NW 2	09301682	CONERGY_MARKETI	04/15/1982	270	--	40	OPEN	GOOD	35-57-50	S	00383
KNOX		WORLD FAIR SITE	10/11/1983	205	60	STEEL	40 - 270		83-55-35	Y	COMM
0147NW 2	09301973	(b) (6)	03/26/1987	350	60	--	OPEN	GOOD	- -		00152
KNOX		COVE POINT	/ /	135	100	STEEL	-- - --		- -	Y	HOME
0147NW 2	09302146	(b) (6) E	04/29/1988	130	90	41	OPEN	GOOD	- -		00264
KNOX		ALVIN LANE	/ /	100	15	STEEL	41 - 130		- -	Y	HOME
0147NW 2	09309032	ATLANTIC CO 0-38-38	/ /19	365	460	100		GOOD	35-57-37	S	
KNOX			/ /	--	13	STEEL	-- - --		83-55-30		HOME
0147NW 2	09309057	WINTER GARDEN00174-	/ /19	250	250	20		UNK	35-59-44	S	
KNOX			/ /	46	20		-- - --		83-55-16		IND
0147NW 2	09309058	WINTER GARDEN CO.	/ /19	400	60	20		UNK	35-59-44	S	
KNOX			/ /	--	40	STEEL	-- - --		83-55-16		IND
0147NW 2	09309060	ROHN-HAAS 0-1760-17	/ /19	160	100	20		UNK	36-03-52	S	
KNOX			/ /	--	34	STEEL	-- - --		84-04-48		IND

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW). TN.

QUAD / NTH	WELL NUM	OWNER'S NAME	COMP DATE	TOT DEPTH	TOT YIELD	CSE DEPTH	WELL FINISH	WAT QUAL	LATITUDE	A/C	DRILLER
COUNTY	REG NUM	LOCATION ROAD	INSPT DATE	AQ DEPTH	STAT LEVEL	CSE TYPE	INTERVAL	TAG NUM	LONGITUDE	LOG	USE
0147NW 2	90002791	(b) (6)	08/27/1990	195	17	104	OPEN	GOOD	- -		00622
KNOX		523 WEST GLENDW	/ /	110	4	STEEL	104 - 195		- -	Y	HOME
0147NW 2	91001408	GERAGTTY & MILLER	01/19/1991	20	--	--	SCREEN	OTHR	- -		00264
KNOX		BROADWAY	/ /	5	--	OTHER	10 - 20		- -	Y	MON
0147NW 2	91001409	GERAGHTY & MILLER	01/19/1991	20	--	--	SCREEN	OTHR	- -		00264
KNOX		BROADWAY	/ /	--	--	OTHER	10 - 20		- -	Y	MON
0147NW 2	91001410	GERAGHTY & MILLER	01/19/1991	20	--	--	SCREEN	OTHR	- -		00264
KNOX		BROADWAY	/ /	--	--	OTHER	10 - 20		- -	Y	MON
0147NW 2	91001411	GERAGHTY & MILLER	01/16/1991	20	--	--	SCREEN	OTHR	- -		00264
KNOX		BROADWAY	/ /	--	--	OTHER	10 - 20		- -	Y	MON
0147NW 2	91001412	GERAGHTY & MILLER	01/16/1991	50	2	40	OPEN	OTHR	- -		00264
KNOX		BROADWAY	/ /	45	15	STEEL	40 - 50		- -	Y	MON
0147NW 2	91001413	GERAGHTY & MILLER	01/19/1991	30	2	20	OPEN	OTHR	- -		00264
KNOX		BROADWAY	/ /	25	15	STEEL	20 - 30		- -	Y	MON
0147NW 2	91001414	GERAGHTY & MILLER	01/19/1991	30	2	20	OPEN	OTHR	- -		00264
KNOX		BROADWAY	/ /	25	15	STEEL	20 - 30		- -	Y	MON
0147NW 2	96004914	(b) (6)	10/12/1996	583	60	170	OPEN	OTHR	- -		00385
KNOX	D0022209	KINGSTON PIKE	/ /	215	--	STEEL	170 - 583		- -	Y	HOME
0147NW 3	09300135	(b) (6)	10/24/1964	100	10	45			- -		00031
KNOX			/ /	30	30	STEEL	-- - --		- -		HOME
0147NW 3	09300179	(b) (6)	05/28/1965	190	20	34			- -		00152
KNOX		KODACK OFF 1MILE	/ /	180	90	STEEL	-- - --		- -		HOME
0147NW 3	09300209	(b) (6)	/ /19	160	3	52		GOOD	- -		00076
KNOX			/ /	30	--	STEEL	-- - --		- -		HOME
0147NW 3	09300394	(b) (6)	08/30/1967	405	10	34		GOOD	- -		00264
KNOX		SPRINGTOWN	/ /	400	300	STEEL	-- - --		- -		FARM
0147NW 3	09300553	JOE HOWELL NURSERY	02/01/1969	720	35	84		GOOD	35-58-50	S	
KNOX			/ /	146	120	STEEL	-- - --		83-53-00		COMM
0147NW 3	09300554	JOE HOWELL NURSERY	07/01/1969	210	100	101		GOOD	35-58-50	S	
KNOX			/ /	195	110	STEEL	148 - 152		83-53-00		COMM
0147NW 3	09300555	JOE HOWELL NURSERY	04/01/1969	220	20	90			35-58-00	S	
KNOX			/ /	92	84	STEEL	-- - --		83-53-00		COMM

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NW 3	09300556	JOE HOWELL NURSERY	09/01/1969	300	20	90		GOOD	35-58-50	S	
KNOX			/ /	150	--	STEEL	-- - --		83-53-00		COMM
0147NW 3	09300557	JOE HOWELL NURSERY	11/01/1969	220	4	88		GOOD	35-58-00	S	
KNOX			/ /	--	90	STEEL	-- - --		83-53-00		COMM
0147NW 3	09301983	TODD____________STEV	05/08/1987	410	12	111	OPEN	OTHR	- -		00660
KNOX		NEUBERT SPGS RD	/ /	410	75	STEEL	111 - 410		- -	Y	HOME
0147NW 3	09309050	DIXIE LAUNDRY COMPA	/ /19	201	350	22		UNK	35-57-40	S	
KNOX			/ /	--	20		-- - --		83-54-21		IND
0147NW 3	09309051	EAST TENN PACKING C	/ /19	100	--	--		UNK	35-57-33	S	
KNOX			/ /	--	45		-- - --		83-54-31		IND
0147NW 3	09309052	EAST TENN PACKING C	/ /19	300	300	44		UNK	35-57-33	S	
KNOX			/ /	200	50	STEEL	-- - --		83-54-31		IND
0147NW 3	09309053	EAST TENN PACKING C	/ /19	213	300	40		UNK	35-57-33	S	
KNOX			/ /	200	45	STEEL	-- - --		83-54-31		IND
0147NW 3	09309056	GRAY KNOX MARBLE CO	/ /19	500	200	--		UNK	35-57-32	S	
KNOX			/ /	425	30	STEEL	-- - --		83-56-52		IND
0147NW 3	09309059	HOTEL FARRAGUT 0-17	/ /19	765	80	110		GOOD	35-57-52	S	
KNOX			/ /	--	90	STEEL	-- - --		83-55-05		IND
0147NW 3	09309061	COCKRUM LUMBER 0-18	/ /19	75	--	--		GOOD	35-59-24	S	-
KNOX			/ /	--	25		-- - --		83-55-40		IND
0147NW 3	09309062	TENN FLOORING 0-181	/ /19	250	120	--		UNK	35-59-30	S	
KNOX			/ /	--	90	STEEL	-- - --		83-54-39		IND
0147NW 3	15500789	(b) (6)	05/24/1968	268	20	95		GOOD	35-52-19	S	00152
SEVIER			/ /	257	--	STEEL	-- - --		83-45-17		FARM
0147NW 3	91003387	APPALACHIAN FINISHI	07/17/1991	465	60	102	OPEN	OTHR	- -		00264
KNOX			/ /	160	12	STEEL	102 - 465		- -	Y	HOME
0147NW 3	91003388	APPALACHIAN FINISHI	07/10/1991	830	10	90	OPEN	OTHR	- -		00264
KNOX			/ /	300	6	STEEL	90 - 830		- -	Y	HOME
0147NW 4	09301559	K.M.C.COMPANY	12/04/1981	165	60	72		GOOD	35-56-46	S	00152
KNOX			/ /	146	90	STEEL	-- - --		83-56-06		COMM
0147NW 4	09302001	(b) (6)	07/16/1987	185	12	59	OPEN	GOOD	35-55-00	-	00077
KNOX		SOUTHERLAND AVE	/ /	160	92	STEEL	59 - 185		83-57-30	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / COUNTY	NTH	WELL NUM / REG NUM	OWNER'S NAME / LOCATION ROAD	COMP DATE / INSPT DATE	TOT DEPTH / AQ DEPTH	TOT YIELD / STAT LEVEL	CSE DEPTH / CSE TYPE	WELL FINISH INTERVAL	WAT QUAL / TAG NUM	LATITUDE / LONGITUDE	A/C LOG	DRILLER / USE
0147NW	4	09309054	(b) (6) (b) (6)	/ /19	192	--	80		GOOD	35-57-27	S	
KNOX				/ /	142	62	STEEL	-- - --		83-59-02		HOME
0147NW	4	91003971	(b) (6)	10/10/1991	180	30	104	OPEN	GOOD	- -		00692
KNOX			KINGSTON PK	/ /	155	70	STEEL	104 - 180		- -	Y	IRR
0147NW	4	92000869	(b) (6)	05/13/1991	442	80	109	OPEN	UNK	- -		00385
KNOX			CRAIG COVE	/ /	235	90	STEEL	109 - 442		- -	Y	HOME
0147NW	4	93002051	(b) (6)	04/26/1993	200	10	125	OPEN	GOOD	- -		00692
KNOX			1100 TOBLER RD	/ /	165	50	STEEL	125 - 200		- -	Y	HOME
0147NW	5	09300029	MAXWELL	08/29/1963	182	--	70		GOOD	35-55-09	S	00241
KNOX				/ /	--	82	STEEL	-- - --		83-55-06		HOME
0147NW	5	09300051	(b) (6)	03/10/1964	173	20	120		GOOD	35-54-25	S	00138
KNOX				/ /	150	135	STEEL	-- - --		83-55-50		HOME
0147NW	5	09301561	(b) (6)	02/08/1982	185	60	73		GOOD	35-55-21	S	00152
KNOX				/ /	115	50	STEEL	-- - --		83-56-16		
0147NW	5	09301562	(b) (6)	02/08/1982	228	20	35		GOOD	35-55-22	S	00152
KNOX				/ /	210	70	STEEL	-- - --		83-56-15		
0147NW	5	09301572	(b) (6)	01/06/1982	300	10	186		GOOD	35-55-33	S	00138
KNOX				/ /	--	90	STEEL	-- - --		83-56-05		HOME
0147NW	5	09309029	CANDORS MABLEE0-44-	/ /19	380	350	10		GOOD	35-55-57	S	
KNOX				/ /	--	65		-- - --		83-55-08		IND
0147NW	5	09309030	KNOX FERTILIZER 0-4	/ /19	700	100	--		GOOD	35-55-12	S	
KNOX				/ /	--	300		-- - --		83-55-33		IND
0147NW	5	09309033	ROBERTSHAW-FULTON C	/ /19	505	500	--		UNK	35-57-03	S	
KNOX				/ /	--	35		-- - --		83-56-27		IND
0147NW	5	09309034	ROBERTSHAW-FULTON C	/ /19	305	250	--		GOOD	35-57-03	S	
KNOX				/ /	250	35		-- - --		83-56-27		OTHR
0147NW	5	09309035	ROGERS W R 0-360-36	/ /19	121	--	40		GOOD	35-55-18	S	
KNOX				/ /	80	44		-- - --		83-56-02		HOME
0147NW	5	09309041	(b) (6)-23 0-2	00/19/1936	104	--	104		GOOD	35-55-09	S	
KNOX				/ /	--	14		-- - --		83-55-45		HOME
0147NW	5	09309044	0-120-1	/ /19	71	--	--		GOOD	35-55-33	S	
KNOX				/ /	--	35		-- - --		83-57-15		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / COUNTY	NTH	WELL NUM / REG NUM	OWNER'S NAME / LOCATION ROAD	COMP DATE / INSPT DATE	TOT DEPTH / AQ DEPTH	TOT YIELD / STAT LEVEL	CSE DEPTH / CSE TYPE	WELL FINISH / INTERVAL	WAT QUAL / TAG NUM	LATITUDE / LONGITUDE	A/C LOG	DRILLER / USE
0147NW	5	91000203	________(b) (6)	07/05/1990	225	12	42	OPEN	OTHR	- -		00152
KNOX			TIPTON STA RD	/ /	90	70	STEEL	-- - --		- -	Y	HOME
0147NW	5	9200407(b) (6)	________	05/20/1988	465	7	147	OPEN	UNK	- -		00385
KNOX			MT OLIVE RD	/ /	--	135	STEEL	47 - 465		- -	Y	HOME
0147NW	6	09300016	(b) (6)	10/12/1963	135	10	25			35-57-25	S	00152
KNOX				/ /	100	50	STEEL	-- - --		83-53-20		HOME
0147NW	6	09300042		01/31/1964	120	--	74		GOOD	35-55-31	S	00031
KNOX				/ /	100	90	STEEL	-- - --		83-53-10		HOME
0147NW	6	09301535		07/11/1981	280	15	72			36-57-12	S	00138
KNOX				/ /	260	80	STEEL	-- - --		83-45-54		HOME
0147NW	6	09301699	(b) (6) ________(b) (6)	09/01/1983	228	--	68	OPEN	GOOD	35-55-00	M	00152
KNOX			MARTIN MILL PK	/ /	150	140	STEEL	68 - 228		83-50-00	Y	HOME
0147NW	6	09301846	(b) (6) ________(b) (6)	11/28/1985	210	10	30	OPEN	OTHR	- -		00115
KNOX			BURNETTS CREEK	/ /	210	30	STEEL	30 - 210		- -	Y	HOME
0147NW	6	09302028	(b) (6) ______ (b) (6)	10/17/1987	225	5	39	OPEN	GOOD	- -		00031
KNOX			MIDWAY RD OF I4	/ /	201	85	STEEL	39 - 225		- -	Y	HOME
0147NW	6	09302029	(b) (6) ______(b) (6)	09/24/1987	210	10	105	OPEN	GOOD	- -		00031
KNOX			MCCUBINS RD	/ /	180	70	STEEL	105 - 210		- -	Y	HOME
0147NW	6	09302030	(b) (6) ______(b) (6)	09/24/1987	145	5	19	OPEN	GOOD	- -		00031
KNOX			STRAW PLAIN PIK	/ /	121	40	STEEL	19 - 145		- -	Y	HOME
0147NW	6	09302031	(b) (6) ______(b) (6)	08/14/1987	168	11	20	OPEN	GOOD	- -		00031
KNOX			TUCK-HOE RD NEA	/ /	168	75	STEEL	20 - 168		- -	Y	HOME
0147NW	6	09309027	(b) (6) L 0-1510-151	00/19/1940	168	--	--		GOOD	35-56-30	S	
KNOX				/ /	--	--		-- - --		83-52-52		HOME
0147NW	6	09309028	(b) (6)	/ /19	120	--	20		GOOD	35-54-42	S	-
KNOX				/ /	--	45		-- - --		83-54-21		HOME
0147NW	6	90000483	JOHNSON________CO_	3/ 7/1990	--	70	315	OPEN	OTHR	- -		00385
KNOX			LOCUST HILL	/ /	394	--	STEEL	-- - 315		- -	Y	IRR
0147NW	6	90000726	(b) (6) ________(b) (6)_	02/15/1990	662	3	62	OPEN	OTHR	- -		00385
KNOX			BLAZIER RD	/ /	189	3	STEEL	62 - 662		- -	Y	HOME
0147NW	6	92004272	(b) (6) ________(b) (6)_	11/14/1992	530	25	42	OPEN	UNK	- -		00684
KNOX			MARTIN MILL PK	/ /	130	120	STEEL	42 - 530		- -	Y	HEAT

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH	WELL NUM	OWNER'S NAME	COMP DATE	TOT DEPTH	TOT YIELD	CSE DEPTH	WELL FINISH	WAT QUAL	LATITUDE	A/C	DRILLER
COUNTY	REG NUM	LOCATION ROAD	INSPT DATE	AQ DEPTH	STAT LEVEL	CSE TYPE	INTERVAL	TAG NUM	LONGITUDE	LOG	USE
0147NW 6	97000439	WONBLES________MI_	01/23/1997	190	8	63	OPEN	GOOD	- -		00667
KNOX	D0019300	BERRY RD	/ /	150	50	STEEL	63 - 190		- -	Y	HOME
0147NW 7	00901338	(b) (6) ________(b) (6)	05/16/1985	245	8	42	OPEN	OTHR	- -		00383
BLOUNT		BEAR HOLLOW	/ /	80	20	STEEL	42 - 245		- -	Y	HOME
0147NW 7	09300002	(b) (6)	08/24/1963	430	6	87			35-53-57	S	00138
KNOX			/ /	400	150	STEEL	-- - --		83-59-36		
0147NW 7	09300086		07/28/1964	450	10	73			35-54-03	S	00152
KNOX			/ /	445	100	STEEL	-- - --		83-59-13		HOME
0147NW 7	09300434	(b) (6)	09/12/1968	200	15	64		GOOD	- -		00385
KNOX		DUNCAN	/ /	185	65	STEEL	-- - --		- -		HOME
0147NW 7	09301708	(b) (6) ________(b) (6)	10/25/1983	455	45	97	OPEN	GOOD	35-53-37	S	00152
KNOX		DUNCAN	/ /	380	280	STEEL	97 - 455		83-59-52	Y	HOME
0147NW 7	09301784	(b) (6) ________(b) (6)	11/14/1984	170	12	55	OPEN	OTHR	- -		00264
KNOX		LIONS BEND	/ /	145	50	STEEL	55 - 170		- -	Y	HOME
0147NW 7	09301885	(b) (6)________(b) (6)	05/16/1986	475	20	150	OPEN	GOOD	- -		00581
KNOX		RIO VISTA LN	/ /	285	--	STEEL	-- - --		- -	Y	IRR
0147NW 7	09301965	(b) (6)________(b) (6)	05/15/1986	200	15	42	OPEN	GOOD	- -		00581
KNOX		TOPSIDE	/ /	165	--	STEEL	42 - 200		- -	Y	HOME
0147NW 7	09309025	(b) (6) J 0-B1	/ /19	97	--	---		GOOD	35-54-52	S	--
KNOX			/ /	--	--		-- - --		83-59-03		HOME
0147NW 7	09309026	(b) (6) P 0-2	/ /19	--	--	--		GOOD	35-54-58	S	
KNOX			/ /	--	--		-- - --		83-59-37		HOME
0147NW 7	09309045	(b) (6) 0-10 0-1	/ /19	151	3	--		GOOD	35-54-53	S	
KNOX			/ /	--	41		-- - --		83-58-18		HOME
0147NW 7	09309046	(b) (6) (b) (6)	/ /19	100	--	35		GOOD	35-53-22	S	
KNOX			/ /	--	16		-- - --		83-59-18		HOME
0147NW 7	09309047	(b) (6) (b) (6)	/ /19	125	--	--		GOOD	35-53-07	S	--
KNOX			/ /	--	60		-- - --		83-58-08		HOME
0147NW 7	90000479	ALCORN__________	06/26/1989	225	60	83	OPEN	OTHR	- -		00385
KNOX		TOPSIDE RD	/ /	195	8	STEEL	83 - 225		- -	Y	HOME
0147NW 7	90003397	(b) (6) _____(b) (6)	08/02/1990	150	60	38	OPEN	OTHR	- -		00383
BLOUNT		LANDING LANE	/ /	60	40	STEEL	38 - 150		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NW 7	92003860	PHILLIPS CONSTRUCTI	09/04/1992	225	20	157	OPEN	OTHR	- -		00608
KNOX		RUDDER LANE	/ /	210	80	STEEL	157 - 225		- -	Y	HOME
0147NW 7	95000558	(b) (6) (b) (6)	01/20/1995	410	80	105	OPEN	OTHR	- -		00383
BLOUNT	D0002871	BEAR HOLLOW	/ /	406	225	STEEL	105 - 410		- -	Y	FARM
0147NW 7	95003758	(b) (6) (b) (6)	08/02/1995	610	12	84	OPEN	OTHR	- -		00383
KNOX	D0011521	BLUE RIDGE DR	/ /	220	100	STEEL	84 - 610		- -	Y	HOME
0147NW 7	95004556	(b) (6) (b) (6)	09/15/1995	660	5	187	OPEN	OTHR	- -		00385
KNOX	D0007907	DUNCAN ROAD	/ /	400	--	STEEL	187 - 660		- -	Y	HOME
0147NW 7	95004557	(b) (6) (b) (6)	09/12/1995	180	50	62	OPEN	OTHR	- -		00385
KNOX	D0007905	RIVERGATE RD	/ /	142	50	STEEL	62 - 180		- -	Y	HOME
0147NW 7	95005532	(b) (6) (b) (6)	09/26/1995	425	6	62	OPEN	UNK	- -		00536
KNOX	D0016353	TIPTON STATION	/ /	350	120	STEEL	62 - 425		- -	Y	HOME
0147NW 8	09300069	CLARK HOME BUILDERS	05/30/1964	100	--	28		GOOD	35-53-43	S	00241
KNOX			/ /	--	60	STEEL	-- - --		83-55-45		HOME
0147NW 8	09300114	(b) (6)	07/22/1964	137	10	63			35-54-08	S	00031
KNOX			/ /	78	60		-- - --		83-55-10		HOME
0147NW 8	09300431		08/02/1968	333	13	8		GOOD	35-54-40	S	00385
KNOX			/ /	320	175	STEEL	-- - --		83-55-45		HOME
0147NW 8	09300443		09/28/1968	216	25	50			35-53-58	S	00138
KNOX			/ /	195	--	STEEL	-- - --		83-55-55		-
0147NW 8	09301638	U T #1	10/09/1982	60	7	40		GOOD	35-54-08	S	00385
KNOX			/ /	52	30	STEEL	-- - --		83-57-16		
0147NW 8	09301639	U T #1A	01/03/1983	60	7	42		GOOD	35-54-08	F	00385
KNOX			/ /	54	30	STEEL	-- - --		83-57-16		
0147NW 8	09301640	U T #1B	/ /19	60	8	42		GOOD	35-54-09	F	00385
KNOX			/ /	51	--	STEEL	-- - --		83-57-16		
0147NW 8	09301641	U T #1C	/ /19	60	--	42			35-54-07	F	00385
KNOX			/ /	--	--	STEEL	-- - --		83-57-15		
0147NW 8	09301642	U T #1D	/ /19	60	--	44			35-54-08	F	00385
KNOX			/ /	--	--	STEEL	-- - --		83-57-16		
0147NW 8	09301643	U T #2	/ /19	70	10	52		GOOD	35-54-08	F	00385
KNOX			/ /	63	35	STEEL	-- - --		83-57-14		

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ	DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NW 8	09301644	U T #2A	/ /19	100		--	47			35-54-08	M	00385
KNOX			/ /	--		35	STEEL	-- - --		83-57-16		
0147NW 8	09301645	U T #3	/ /19	100		7	44		GOOD	35-54-08	F	00385
KNOX			/ /	65		30	STEEL	-- - --		83-57-16		
0147NW 8	09301646	U T #3A	/ /19	100		--	46			35-54-08	F	00385
KNOX			/ /	--		30	STEEL	-- - --		83-57-16		
0147NW 8	09301647	U T #3B	/ /19	100		--	44			35-54-08	F	00385
KNOX			/ /	--		30	STEEL	-- - --		83-57-16		
0147NW 8	09301648	U T #3C	/ /19	100		--	42			35-54-08	F	00385
KNOX			/ /	--		30	STEEL	-- - --		83-57-17		
0147NW 8	09301649	U T #3D	/ /19	100		--	42			35-54-08	F	00385
KNOX			/ /	--		30	STEEL	-- - --		83-57-16		
0147NW 8	09301650	U T #3E	/ /19	100		--	42			35-54-08	F	00385
KNOX			/ /	--		30	STEEL	-- - --		83-57-16		
0147NW 8	09301651	U T #3F	/ /19	100		--	43			35-54-08	F	00385
KNOX			/ /	--		30	STEEL	-- - --		83-57-16		
0147NW 8	09301652	U T #3G	01/05/1983	100		--	42			35-54-08	F	00385
KNOX			/ /	--		35	STEEL	-- - --		83-57-16		
0147NW 8	09301653	U T #4	/ /19	80		13	51			35-54-08	F	00385
KNOX			/ /	75		--	STEEL	-- - --		83-57-16		
0147NW 8	09301654	U T #5	/ /19	90		12	61		GOOD	35-54-08	F	00385
KNOX			/ /	80		30	STEEL	-- - --		83-57-16		
0147NW 8	09301655	U T #5A	/ /19	100		--	42			35-54-08	F	00385
KNOX			/ /	--		--	STEEL	-- - --		83-57-16		
0147NW 8	09301656	U T #6	/ /19	60		--	61			35-54-08	F	00385
KNOX			/ /	--		--	STEEL	-- - --		83-57-16		
0147NW 8	09301676	(b) (6) (b) (6) (b) (6)	03/30/1983	300		25	63	OPEN	GOOD	35-53-25	S	00152
KNOX		CRENSHAW	07/28/1983	185		160	STEEL	63 - 300		83-55-18	Y	HOME
0147NW 8	09301697	(b) (6) (b) (6)	08/03/1983	125		--	68	OPEN	OTHR	35-50-00	M	00365
KNOX		TIPTON STATION	/ /	--		60	STEEL	68 - 125		83-55-00	N	HOME
0147NW 8	09301960	(b) (6) (b) (6)	02/12/1987	240		10	60	OPEN	OTHR	- -		00138
KNOX		OLD MARYVILLE P	/ /	220		--	STEEL	60 - 240		- -	Y	OTHR

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT AQ	DEPTH DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NW 8 KNOX	09302087	(b) (6) ________(b) (6)_ TOOLS BEND RD	04/16/1988 / /	210 190		12 100	167 STEEL	OPEN 167 - 210	GOOD	- - - -	 Y	00536 HOME
0147NW 8 KNOX	09309036	(b) (6) 0-35 0-3	00/19/1928 / /	47 --		-- 12	10	 -- - --	GOOD	35-54-04 83-56-19	S	 HOME
0147NW 8 KNOX	09309037	(b) (6) 03	/ /19 / /	165 --		-- 65	70	 -- - --	GOOD	35-53-05 83-56-18	S	 HOME
0147NW 8 KNOX	09309038	(b) (6) 0-28-128-	00/19/1943 / /	135 80		-- 25	70	 -- - --	GOOD	35-54-03 83-57-05	S	 HOME
0147NW 8 KNOX	09309039	(b) (6) 0-26-2	00/19/1943 / /	78 --		-- 5	40	 -- - --	GOOD	35-54-49 83-56-46	S	 HOME
0147NW 8 KNOX	09309040	(b) (6) 0-24	/ /19 / /	165 --		-- 40	35	 -- - --	GOOD	35-54-49 83-56-46	S	 HOME
0147NW 8 KNOX	09309042	(b) (6) 0-20 0-2	/ /19 / /	125 --		-- 35	30	 -- - --	GOOD	35-54-26 83-54-23	S	 HOME
0147NW 8 KNOX	09309043	(b) (6) 0-19 0-1	/ /19 / /	95 --		-- 40	16	 -- - --	GOOD	35-54-22 83-57-27	S	 HOME
0147NW 8 BLOUNT	94003853 D0002865	(b) (6) ________(b) (6)_ CUB RD	10/04/1994 / /	230 220		15 20	42 STEEL	OPEN 42 - 230	OTHR	- - - -	 Y	00383 HOME
0147NW 8 KNOX	94004026 D0000000	BAGWELL COMMUNICATI	09/17/1994 / /	550 115		100 32	85 STEEL	OPEN 85 - 550	GOOD	- - - -	 Y	00385 IRR
0147NW 8 KNOX	94004027 D0000000	(b) (6) ________(b)_ SMOKY VIEW RD	08/15/1994 / /	350 250		60 45	106 STEEL	OPEN 106 - 350	GOOD	- - - -	 Y	00385 HOME
0147NW 9 KNOX	09300298	(b) (6)	10/28/1966 / /	434 432		11 --	353 STEEL	 -- - --	GOOD	35-54-20 83-54-22	S	00385 HOME
0147NW 9 KNOX	09300299		10/07/1966 / /	251 246		6 --	63 STEEL	 -- - --	BAD	35-54-08 83-54-30	S	00385 HOME
0147NW 9 KNOX	09300361		09/22/1967 / /	410 402		40 --	226 STEEL	 -- - --	GOOD	35-54-20 83-53-00	S	00152 HOME
0147NW 9 KNOX	09300644	 MT OLIVE	05/11/1971 / /	155 145		19 80	95 STEEL	 -- - --		- - - -		00152 HOME
0147NW 9 KNOX	09301231	(b) (6) (b) (6) GODDARD	07/10/1978 / /	169 100		50 35	31 STEEL	 -- - --	GOOD	35-52-44 83-54-20	S	00383 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NW 9	09301482	(b) (6)	00/00/1981	120	50	47		GOOD	- -		00138
KNOX			/ /	100	30	STEEL	-- - --		- -		HOME
0147NW 9	09301538		07/29/1981	500	30	21			35-54-10	S	00138
KNOX			/ /	485	200	STEEL	-- - --		83-54-30		HOME
0147NW 9	09301555		06/25/1981	392	13	105			35-54-25	S	00385
KNOX			/ /	365	100	STEEL	-- - --		83-54-30		HOME
0147NW 9	09301613		07/28/1982	125	30	81		GOOD	35-53-50	S	00385
KNOX			/ /	95	--	STEEL	-- - --		83-53-41		HOME
0147NW 9	09301617		09/11/1982	210	7	61		GOOD	35-53-57	S	00385
KNOX			/ /	204	50	STEEL	-- - --		83-53-39		HOME
0147NW 9	09301764	(b) (6) ______(b) (6)	04/16/1984	160	30	--	OPEN	GOOD	36-50-00	T	00385
KNOX		TWIN CREEK RD	03/10/1986	100	30	STEEL	-- - --		83-55-00	Y	HOME
0147NW 9	09301964	(b) (6) ______(b) (6)	04/14/1987	134	50	53	OPEN	GOOD	- -		00622
KNOX		TWIN CREEK RD	/ /	70	48	STEEL	53 - 134		- -	Y	HOME
0147NW 9	09309031	(b) (6) 0-41-41	/ /19	190	--	--		GOOD	35-54-56	S	
KNOX			/ /	--	60		-- - --		83-54-38		HOME
0147NW 9	09309048	(b) (6) (b) (6)	/ /19	152	20	40		UNK	35-52-50	S	
KNOX			/ /	--	11		-- - --		83-54-56		HOME
0147NW 9	09309049	(b) (6) (b) (6)	/ /19	94	20	40		GOOD	35-53-04	S	
KNOX			/ /	--	24	STEEL	-- - --		83-54-31		HOME
0147NW 9	90000470	(b) (6) ______(b) (6)	10/ 1/1988	561	60	--	OPEN	UNK	- -		00385
KNOX			/ /	63	5	STEEL	57 - 561		- -	Y	HOME
0147NW 9	90000480	(b) (6) ______(b) (6)	07/25/1989	241	22	62	OPEN	OTHR	- -		00385
KNOX		HARRIS LN	/ /	78	3	STEEL	62 - 241		- -	Y	HOME
0147NW 9	90000725	(b) (6) ______(b) (6)	02/06/1990	141	14	62	OPEN	OTHR	- -		00385
KNOX		TWIN CREEK RD	/ /	126	3	STEEL	62 - 141		- -	Y	HOME
0147NW 9	90002339	(b) (6) ______(b) (6)	06/01/1990	650	2	315	OPEN	OTHR	- -		00264
KNOX			/ /	400	20	STEEL	315 - 650		- -	Y	HOME
0147NW 9	90002358	(b) (6) ______(b) (6)	06/01/1990	650	2	315	OPEN	OTHR	- -		00264
KNOX			/ /	400	20	STEEL	315 - 650		- -	Y	HOME
0147NW 9	91000813	(b) (6) ______(b) (6)	02/23/1991	345	7	125	OPEN	GOOD	- -		00264
KNOX			/ /	345	50	STEEL	-- - 125		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE KNOXVILLE QUADRANGLE (0147NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NW 9 KNOX	93002835	(b) (6) (b) (6) BLAZER RD	06/28/1993 4/26/1994	225 170	100 105	82 STEEL	OPEN 82 - 225	OTHR 008297	35-51-37 83-52-19	S Y	00264 IRR
0147NW 9 KNOX	93002836	(b) (6) (b) (6) BLAZER RD	06/24/1993 4/26/1994	525 485	-- 200	285 STEEL	OPEN 285 - 525	OTHR 008296	35-51-00 83-52-19	S Y	00264 HOME
0147NW 9 KNOX	93002837	(b) (6) (b) (6) BLAZER RD	06/25/1993 4/26/1994	340 325	40 200	119 STEEL	OPEN 119 - 340	OTHR 008298	35-50-54 83-52-18	S Y	00264 HOME
0147NW 9 KNOX	95003547 D0011953	(b) (6) (b) (6) NEUBERT SPRINGS	07/19/1995 / /	425 135	3 115	82 STEEL	OPEN 82 - 425	GOOD	- - - -	 Y	00622 HOME
0147NW 9 KNOX	96002621 D0016887	(b) (6) (b) (6) TIPTON STATION	05/13/1996 / /	200 50	60 40	21 STEEL	OPEN 60 - 200	OTHR	- - - -	 Y	00385 HOME

" Water Wells on the Maryville Quadrangle "

TDEC/DWS. 1997b. Records of Water Wells on the Maryville Quadrangle (0147SW) TN. November 12. pp.:35-43.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE Maryville. QUADRANGLE (0147SW) TN.

QUAD / COUNTY	NTH	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147SW KNOX	3	09301669	(b) (6) ________ (b) (6) MARTIN MILL PIK	05/02/1983 07/28/1983	231 150	-- 60	142 STEEL	OPEN 142 - 231	GOOD	35-51-25 83-52-49	S Y	00385 HOME
0147SW BLOUNT	1	00900137	(b) (6)	12/08/1965 / /	147 125	15 90	95 STEEL	-- - --		35-51-34 83-59-25	S	00138 HOME
0147SW BLOUNT	1	00900201		02/06/1967 / /	354 311	150 75	52 STEEL	-- - --	GOOD	35-51-10 83-59-03	S	00385 IND
0147SW BLOUNT	1	00900232		12/29/1967 / /	78 --	-- 10	24 STEEL	-- - --		35-52-15 83-59-50	S	00093 HOME
0147SW BLOUNT	1	00901180	(b) (6) ________ (b) (6) RIVER RD	09/14/1982 / /	250 125	5 65	42 STEEL	OPEN 42 - 250	GOOD	- - - -	Y	00383 HOME
0147SW BLOUNT	1	00901426	(b) (6) ________ (b) (6) BEAU'S BEND	03/24/1986 / /	165 102	12 100	40 STEEL	OPEN -- - --	GOOD	- - - -	Y	00622 HOME
0147SW BLOUNT	1	00901458	(b) (6) ________ (b) (6) FOX HILLS	07/09/1986 / /	450 407	5 84	145 STEEL	OPEN 145 - 450	GOOD	- - - -	Y	00622 HOME
0147SW BLOUNT	1	00901536	(b) (6) ________ (b) (6) FOX HILL RD	06/08/1987 / /	100 95	35 30	41 STEEL	OPEN 41 - 100	GOOD	- - - -	Y	00622 HOME
0147SW KNOX	1	09301230	(b) (6) (b) (6) LITTLE RIVER	06/20/1978 / /	395 370	13 --	135 STEEL	-- - --	GOOD	35-52-10 83-58-15	S	00385 HOME
0147SW KNOX	1	09301239	(b) (6) (b) (6) TOPSIDE	05/00/1978 / /	460 --	8 --	154 STEEL	-- - --	GOOD	35-52-21 83-57-56	S	00138 HOME
0147SW KNOX	1	09301549	(b) (6)	11/13/1981 / /	128 113	104 15	63 STEEL	-- - --	GOOD	35-52-27 83-58-45	S	00385
0147SW KNOX	1	09301585	P.B.S.CONST. COMPAN	06/08/1982 / /	300 260	9 80	74	-- - --	GOOD	35-51-57 83-58-20	S	00138 HOME
0147SW KNOX	1	09301596	(b) (6)	01/20/1982 / /	395 385	30 65	122 STEEL	-- - --	GOOD	35-52-05 83-58-25	S	00385 HOME
0147SW BLOUNT	1	92002077	(b) (6) ________ (b) (6) BEAUS BEND	05/22/1992 / /	300 89	4 49	62 STEEL	OPEN 62 - 300	GOOD	- - - -	Y	00622 HOME
0147SW BLOUNT	1	92002660	(b) (6) ________ (b) (6) BEND ROAD	07/09/1992 / /	200 105	10 73	104 STEEL	OPEN 104 - 200	GOOD	- - - -	Y	00622 HOME
0147SW BLOUNT	1	94003421 D0005184	(b) (6) ________ (b) (6) FOX HILLS DRIVE	09/07/1994 / /	175 102	29 27	62 STEEL	OPEN 62 - 175	GOOD	- - - -	Y	00622 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147SW 1 KNOX	94004049 D0000000	(b) (6) (b) (6) OFF HARVEY RD	09/25/1994 / /	441 405	20 80	85 STEEL	OPEN 85 - 441	GOOD	- - - -	 Y	00385 HOME
0147SW 1 BLOUNT	95004598 D0011971	(b) (6) (b) (6) CONGER	09/28/1995 / /	250 155	21 48	77 STEEL	OPEN 77 - 250	GOOD	- - - -	 Y	00622 HOME
0147SW 1 BLOUNT	96000821 D0010098	(b) (6) (b) (6) RIVERS EDGE	02/22/1996 / /	75 66	100 26	38 STEEL	OPEN 38 - 75	GOOD	- - - -	 Y	00622 HOME
0147SW 1 BLOUNT	96004512 D0022205	(b) (6) (b) (6) ALS LANE	09/26/1996 / /	162 85	30 --	76 STEEL	OPEN 76 - 162	OTHR	- - - -	 Y	00385 HOME
0147SW 2 BLOUNT	00900233	(b) (6)	12/15/1967 / /	100 --	-- 20	60 STEEL	-- - --		35-51-45 83-57-20	S	00093 HOME
0147SW 2 BLOUNT	00900234		11/30/1967 / /	100 --	-- 24	30 STEEL	-- - --		35-51-27 83-57-02	S	00093 HOME
0147SW 2 BLOUNT	00900235		11/20/1967 / /	130 --	-- 40	40 STEEL	-- - --		35-51-05 83-56-55	S	00093 HOME
0147SW 2 BLOUNT	00900281	(b) (6) (b) (6)	11/04/1965 01/15/1985	300 285	40 60	40 STEEL	-- - --	GOOD	35-51-15 83-55-35	S	00080 HOME
0147SW 2 BLOUNT	00901112	(b) (6) (b) (6) RODDY BRANCH	05/09/1983 07/28/1983	65 36	-- 2	13 STEEL	OPEN 13 - 65	OTHR	35-51-17 83-55-52	S Y	00385 HOME
0147SW 2 BLOUNT	00901170	(b) (6) (b) (6) RODDY BRANCH RD	08/09/1984 / /	180 93	6 10	82 STEEL	OPEN 82 - 180	BAD	- - - -	 Y	00385 HOME
0147SW 2 KNOX	09302156	(b) (6) (b) (6) MARTIN MILL PIK	11/17/1989 / /	570 565	80 100	272 STEEL	OPEN 272 - 570	OTHR	- - - -	 Y	00264 HOME
0147SW 2 KNOX	92002454	(b) (6) (b) (6) DAY	04/15/1992 / /	390 380	30 110	199 STEEL	OPEN 199 - 390	GOOD	- - - -	 Y	00536 HOME
0147SW 2 BLOUNT	92003857	(b) (6) (b) (6) HWY 33	08/01/1992 / /	405 385	15 150	343 STEEL	OPEN 343 - 405	OTHR	- - - -	 Y	00608 HOME
0147SW 2 KNOX	93004729	(b) (6) (b) (6) TIPTON STA RD	05/27/1992 / /	242 57	8 25	38 STEEL	OPEN 38 - 242	OTHR	- - - -	 Y	00385 HOME
0147SW 2 KNOX	93004743	(b) (6) (b) (6) 2206 LITTLE VAL	10/22/1993 / /	182 126	12 20	87 STEEL	OPEN 87 - 182	OTHR	- - - -	 Y	00385 HOME
0147SW 2 KNOX	93004744	(b) (6) (b) (6) TOP SIDE RD	09/18/1993 / /	381 305	25 80	152 STEEL	OPEN 152 - 381	H2S	- - - -	 Y	00385 IRR

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147SW 2 KNOX	94004035 D0002899	(b) (6) (b) (6) TARKIN VALLEY R	04/14/1994 / /	260 102	30 35	87 STEEL	OPEN 87 - 260	UNK	- - - -	 Y	00385 HOME
0147SW 2 KNOX	94004036 D0002900	(b) (6) (b) (6) TARKIN VALLEY R	04/15/1994 / /	100 55	60 20	21 STEEL	OPEN 21 - 100	OTHR	- - - -	 Y	00385 HOME
0147SW 2 BLOUNT	95004561 D0007908	(b) (6) (b) (6) RODDY BRANCH	09/25/1995 / /	140 128	50 --	39 STEEL	OPEN 39 - 140	OTHR	- - - -	 Y	00385 HOME
0147SW 3 BLOUNT	00901097	(b) (6)	05/18/1982 / /	108 107	17 12	42 STEEL	 -- - --	GOOD	35-50-14 83-52-40	S	00385 HOME
0147SW 3 BLOUNT	00901153	(b) (6) (b) (6) GLOVER	09/10/1983 12/19/1983	250 140	52 25	109 STEEL	OPEN 109 - 250	GOOD	35-50-14 83-52-36	S Y	00385 HOME
0147SW 3 BLOUNT	00901641	(b) (6) (b) (6) SELF HOLLOW RD	08/07/1988 / /	275 255	12 75	67 STEEL	OPEN 67 - 275	OTHR	- - - -	 Y	00383 HOME
0147SW 3 BLOUNT	00901717	(b) (6) (b) (6) RODDY BRANCH RD	02/10/1989 / /	145 130	30 1	41 STEEL	OPEN 41 - 145	OTHR	- - - -	 Y	00608 HOME
0147SW 3 BLOUNT	00901773	(b) (6) (b) (6) KERR	07/20/1989 / /	210 180	10 45	119 STEEL	OPEN 119 - 210	OTHR	- - - -	 Y	00383 HOME
0147SW 3 KNOX	09300031	(b) (6) F BLAZER	11/16/1963 / /	74 --	-- --	58 STEEL	 -- - --	GOOD	35-51-22 83-53-21	S	00241 HOME
0147SW 3 KNOX	09301371	(b) (6)	06/15/1979 / /	374 370	4 65	21 STEEL	 -- - --	GOOD	35-51-54 83-54-30	S	00385 HOME
0147SW 3 KNOX	09301529		10/08/1981 / /	-- --	8 --	63 STEEL	 -- - --	GOOD	35-50-50 83-53-26	S	00138 HOME
0147SW 3 KNOX	09301550		09/29/1981 / /	190 180	13 40	42	 -- - --	GOOD	35-51-55 83-53-29	S	00385 HOME
0147SW 3 KNOX	09301554		06/23/1981 / /	228 205	25 60	42 STEEL	 -- - --	GOOD	35-52-04 83-53-25	S	00385 HOME
0147SW 3 KNOX	09301577		02/23/1982 / /	310 287	6 95	63 STEEL	 -- - --	GOOD	35-52-27 83-52-35	S	00580 HOME
0147SW 3 KNOX	09301668	(b) (6) (b) (6) LOUIS WISE	05/04/1983 07/28/1983	185 108	-- 500	81 STEEL	OPEN 81 - 185	GOOD	35-51-49 83-52-34	S Y	00385 HOME
0147SW 3 KNOX	09301706	(b) (6) (b) (6) MARTIN MILL PK	08/10/1983 08/11/1983	125 117	50 40	93 STEEL	OPEN 93 - 125	GOOD	35-51-34 83-53-03	S N	00385 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147SW 3	09301769	(b) (6) (b) (6)	06/28/1984	300	30	105	OPEN	GOOD	- -		00383
KNOX		MARTIN MILL PIK	/ /	290	100	STEEL	105 - 300		- -	Y	HOME
0147SW 3	09301770	(b) (6) (b) (6)	06/21/1984	250	8	85	OPEN	GOOD	- -		00383
KNOX		MARTIN MILL PIK	/ /	240	85	STEEL	85 - 250		- -	Y	HOME
0147SW 3	09301861	(b) (6) (b) (6)	02/16/1985	290	10	43	OPEN	OTHR	- -		00536
KNOX		MCCAMMA RD	/ /	250	80	STEEL	43 - 290		- -	Y	HOME
0147SW 3	09301938	(b) (6) (b) (6)	08/27/1986	200	10	54	OPEN	OTHR	- -		00138
KNOX		MARTIN MILL	/ /	180	--	STEEL	54 - 200		- -	Y	HOME
0147SW 3	09301970	(b) (6) (b) (6)	05/15/1985	250	8	62	OPEN	OTHR	- -		00536
KNOX		MCCAMMON	/ /	220	50	STEEL	62 - 250		- -	Y	HOME
0147SW 3	09301976	(b) (6)	10/30/1986	200	60	83	OPEN	OTHR	- -		00383
KNOX		MARTIN MILL PIK	/ /	175	60	STEEL	83 - 200		- -	Y	HOME
0147SW 3	09301977	(b) (6) (b) (6)	10/29/1986	275	25	189	OPEN	OTHR	- -		00383
KNOX		MCCANMAN	/ /	250	50	STEEL	189 - 275		- -	Y	HOME
0147SW 3	09301979	(b) (6) (b) (6)	05/16/1987	225	30	115	OPEN	OTHR	- -		00383
KNOX		LYNNWOOD DR	/ /	105	60	STEEL	115 - 225		- -	Y	HOME
0147SW 3	09309175	(b) (6)	10/00/1979	180	--	--		BAD	35-51-52	S	00412
KNOX			/ /	--	--	STEEL	-- - --		83-54-31		HOME
0147SW 3	90000496	(b) (6) (b) (6)	08/25/1989	327	70	294	OPEN	OTHR	- -		00385
BLOUNT			/ /	321	--	STEEL	294 - 327		- -	Y	HOME
0147SW 3	90000728	(b) (6)	02/27/1990	362	20	121	OPEN	OTHR	- -		00385
KNOX		8831 MARTIN MIL	/ /	352	4	STEEL	121 - 362		- -	Y	HOME
0147SW 3	91001150	(b) (6) (b) (6)	02/22/1991	225	15	105	OPEN	OTHR	- -		00152
BLOUNT		BLAZIER RD	/ /	200	110	STEEL	-- - --		- -	Y	HOME
0147SW 3	91003389	(b) (6) (b) (6)	07/04/1991	890	1	102	OPEN	UNK	- -		00264
BLOUNT			/ /	830	60	STEEL	102 - 890		- -	Y	HOME
0147SW 3	92000868	(b) (6) (b) (6)	10/24/1991	401	7	134	OPEN	UNK	- -		00385
KNOX		MCCAMMON RD	/ /	232	--	STEEL	134 - 401		- -	Y	HOME
0147SW 3	93004363	(b) (6) (b) (6)	09/30/1993	465	10	104	OPEN	UNK	35-51-23	S	00536
KNOX		MCCAMMON2547	4/20/1994	260	50	STEEL	104 - 465	008295	83-53-19	Y	HOME
0147SW 3	94000005	(b) (6) (b) (6)	12/01/1993	425	6	102	OPEN	GOOD	- -		00622
KNOX	D0005107	MCCAMMON DRIVE	/ /	135	56	PLAST	102 - 425		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH	WELL NUM	OWNER'S NAME	COMP DATE	TOT DEPTH	TOT YIELD	CSE DEPTH	WELL FINISH	WAT QUAL	LATITUDE	A/C	DRILLER
COUNTY	REG NUM	LOCATION ROAD	INSPT DATE	AQ DEPTH	STAT LEVEL	CSE TYPE	INTERVAL	TAG NUM	LONGITUDE	LOG	USE
0147SW 3	94001662	(b) (6) (b) (6)	05/25/1994	465	20	116	OPEN	GOOD	- -		00264
KNOX	D0002193		/ /	300	100	STEEL	116 - 465		- -	Y	HOME
0147SW 3	94003517	(b) (6) (b) (6)	08/22/1994	245	10	75	OPEN	UNK	35-50-15	S	00684
BLOUNT	D0008573	JAY KERR RD 3856	6/ 6/1995	200	30	STEEL	75 - 245	008838	83-53-08	Y	HOME
0147SW 3	94004232	(b) (6) (b) (6)	10/17/1994	530	3	62	OPEN	UNK	35-50-49	S	00264
KNOX	D0009412	2700 BLAZIER RD	6/20/1995	200	40	STEEL	62 - 530	008871	83-53-24	Y	HOME
0147SW 3	95002775	(b) (6) NWAY (b) (6)	06/06/1995	581	7	47	OPEN	OTHR	- -		00385
BLOUNT	D0007882	GLOVER ROAD	/ /	330	--	STEEL	47 - 581		- -	Y	HOME
0147SW 3	95004018	(b) (6) (b) (6)	08/23/1995	220	60	104	OPEN	OTHR	- -		00385
KNOX	D0007900	MCCANNON	/ /	--	--	STEEL	104 - 220		- -	Y	HOME
0147SW 3	95004391	(b) (6) (b) (6)	08/15/1995	200	60	63		OTHR	- -		00383
BLOUNT	D0014252	KERR	/ /	195	30	STEEL	63 - 200		- -	Y	HOME
0147SW 3	96002624	(b) (6) (b) (6)	05/21/1996	240	60	120	OPEN	OTHR	- -		00385
KNOX	D0016890	MCCANNON RD	/ /	155	60	STEEL	120 - 240		- -	Y	HOME
0147SW 3	96003055	(b) (6) (b) (6)	07/02/1996	225	15	133	OPEN	OTHR	- -		00608
BLOUNT	D0020967	KERR RD	/ /	190	60	STEEL	133 - 225		- -	Y	HOME
0147SW 3	96003656	(b) (6) (b) (6)	07/24/1996	222	30	80	OPEN	OTHR	- -		00385
KNOX	D0020179	MCCAMMON ROAD	/ /	102	--	STEEL	80 - 222		- -	Y	HOME
0147SW 3	97000067	(b) (6) (b) (6)	10/22/1996	345	25	186	OPEN	UNK	- -		00536
KNOX	D0022563	MCCAMMON RD	/ /	325	90	STEEL	186 - 345		- -	Y	HOME
0147SW 3	97003339	(b) (6) (b) (6)	07/21/1997	120	15	84	OPEN	OTHR	- -		00385
KNOX	D0022188	MCCAMMON RD	/ /	100	--	STEEL	84 - 120		- -	Y	HOME
0147SW 4	00901778	(b) (6) (b) (6)	08/19/1989	210	12	58		OTHR	- -		00383
BLOUNT		GLOUR	/ /	100	40	STEEL	58 - 210		- -	Y	HOME
0147SW 4	94005036	CENTRAL POINT BAPT	11/19/1994	660	7	63	OPEN	OTHR	- -		00385
BLOUNT	D0007949	CENTRAL PARK RD	/ /	310	--	STEEL	63 - 660		- -	Y	HOME
0147SW 4	95000749	(b) (6) (b) (6)	02/08/1995	130	40	63	OPEN	GOOD	- -		00536
BLOUNT	D0012478	DEVAULT ROAD	/ /	105	60	STEEL	63 - 130		- -	Y	HOME
0147SW 5	00901190	(b) (6) (b) (6)	11/10/1982	175	30	43	OPEN	GOOD	- -		00383
BLOUNT		LITTLE RIVER RD	/ /	160	70	STEEL	43 - 175		- -	Y	HOME
0147SW 5	00901378	POPE'S_PLANT_FA	10/23/1985	145	25	32	OPEN	GOOD	- -		00622
BLOUNT		ALCOA TRAIL	06/17/1986	80	30	STEEL	32 - 145		- -	Y	IRR

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH	WELL NUM	OWNER'S NAME	COMP DATE	TOT DEPTH	TOT YIELD	CSE DEPTH	WELL FINISH	WAT QUAL	LATITUDE	A/C	DRILLER
COUNTY	REG NUM	LOCATION ROAD	INSPT DATE	AQ DEPTH	STAT LEVEL	CSE TYPE	INTERVAL	TAG NUM	LONGITUDE	LOG	USE
0147SW 5	00901422	(b) (6) (b) (6)	04/10/1986	125	60	50	OPEN	GOOD	- -		00622
BLOUNT		ALCOA TRAILS	/ /	116	25	STEEL	-- - --		- -	Y	HOME
0147SW 5	00901505	(b) (6) (b) (6)	02/24/1987	105	50	41		GOOD	- -		00622
BLOUNT		HOLLY BROOK	/ /	87	22	OTHER	41 - 105		- -	Y	HOME
0147SW 5	00901519	(b) (6) (b) (6)	09/09/1986	225	--	165	OPEN	OTHR	- -		00383
BLOUNT		RUSSELL	/ /	210	50	STEEL	165 - 225		- -	Y	HOME
0147SW 5	00901551	(b) (6) (b) (6)	11/13/1986	400	4	126	OPEN	OTHR	- -		00383
BLOUNT		OLD ROCKFORD	/ /	250	50	STEEL	126 - 400		- -	Y	HOME
0147SW 5	00901610	(b) (6) (b) (6)	05/09/1988	300	8	20	OPEN	GOOD	- -		00622
BLOUNT		SAM HOUSTON SCH	/ /	160	--	STEEL	20 - 300		- -	Y	HOME
0147SW 5	00901698	(b) (6) (b) (6)	10/12/1988	125	28	41	OPEN	GOOD	- -		00622
BLOUNT		OLD KNOX HWY	/ /	65	37	STEEL	42 - 125		- -	Y	HOME
0147SW 5	00901739	(b) (6) (b) (6)	05/03/1989	1073	9	41	OPEN	GOOD	- -		00622
BLOUNT		MARTIN MILL PIK	/ /	236	30	STEEL	41 - 1073		- -	Y	HOME
0147SW 5	92000016	(b) (6) (b) (6)	07/23/1991	205	20	42	OPEN	GOOD	- -		00031
BLOUNT		ROCK RD	/ /	180	40	STEEL	42 - 205		- -	Y	HOME
0147SW 5	92003412	(b) (6) (b) (6)	07/30/1992	310	30	65	OPEN	OTHR	- -		00383
BLOUNT		FOX HILLS	/ /	275	85	STEEL	65 - 310		- -	Y	HOME
0147SW 5	93002546	POPES PLANT FARM	07/08/1993	150	12	20	OPEN	GOOD	35-48-28	S	00622
BLOUNT		ALCOA TRAIL	4/18/1994	64	4	STEEL	20 - 150	008293	83-57-27	Y	IRR
0147SW 5	93002551	POPES PLANT FARM	07/19/1993	66	25	62	OPEN	GOOD	35-48-25	S	00622
BLOUNT		ALCOA TRAIL	4/18/1994	65	0	STEEL	62 - 66	008292	83-57-29	Y	IRR
0147SW 5	93002930	POPES PLANT FARM	07/30/1993	100	30	20	OPEN	GOOD	35-48-25	S	00622
BLOUNT		ALCOA TRAIL	4/18/1994	85	1	STEEL	20 - 100	008291	83-47-30	Y	IRR
0147SW 6	00901181	(b) (6) (b) (6)	04/25/1983	225	15	42	OPEN	GOOD	- -		00383
BLOUNT		HOLLYBROOK	/ /	205	90	STEEL	42 - 225		- -	Y	HOME
0147SW 6	00901249	(b) (6) (b) (6)	04/16/1984	345	7	69	OPEN	GOOD	- -		00383
BLOUNT		SELF HOLLOW	/ /	125	50	STEEL	69 - 345		- -	Y	HOME
0147SW 6	00901353	(b) (6) (b) (6)	08/21/1985	250	9	95	OPEN	GOOD	- -		00622
BLOUNT		MARTINMILL PK	/ /	160	45	STEEL	95 - 250		- -	Y	HOME
0147SW 6	00901372	(b) (6) (b) (6)	09/10/1985	120	7	63	OPEN	OTHR	35-47-30	-	00383
BLOUNT		HALLYBROOK	06/17/1986	70	50	OTHER	63 - 120		83-52-30	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH	WELL NUM	OWNER'S NAME	COMP DATE	TOT DEPTH	TOT YIELD	CSE DEPTH	WELL FINISH	WAT QUAL	LATITUDE	A/C	DRILLER
COUNTY	REG NUM	LOCATION ROAD	INSPT DATE	AQ DEPTH	STAT LEVEL	CSE TYPE	INTERVAL	TAG NUM	LONGITUDE	LOG	USE
0147SW 6	00901528	(b) (6) (b) (6)	05/01/1982	250	20	34	OPEN	GOOD	- -		00622
BLOUNT		MARTIN MILL PIK	/ /	170	42	STEEL	34 - 250		- -	Y	HOME
0147SW 6	00901674	(b) (6) (b) (6)	06/04/1988	100	20	23	OPEN	GOOD	- -		00383
BLOUNT		HARRIS	/ /	85	20	STEEL	23 - 100		- -	Y	HOME
0147SW 6	00901753	(b) (6) (b) (6)	04/19/1989	290	12	65	OPEN	OTHR	- -		00383
BLOUNT		HOLLYBROOK	/ /	160	60	STEEL	65 - 290		- -	Y	HOME
0147SW 6	00901786	(b) (6) (b) (6)	03/17/1989	350	15	44	OPEN	GOOD	- -		00031
BLOUNT		MARTIN MILL PIK	/ /	210	90	STEEL	44 - 350		- -	Y	HOME
0147SW 6	90001631	(b) (6) (b) (6)	05/21/1990	310	12	39	OPEN	GOOD	- -		00031
BLOUNT		WILD WOOD RD	/ /	108	9	STEEL	-- - --		- -	N	HOME
0147SW 6	90003111	(b) (6) (b) (6)	09/17/1990	297	6	62	OPEN	GOOD	- -		00622
BLOUNT		GLOVER RD	/ /	94	60	STEEL	62 - 297		- -	Y	HOME
0147SW 6	90003382	(b) (6) (b) (6)	07/31/1990	100	30	49	OPEN	OTHR	- -		00383
BLOUNT		HOLLEYBROOK	/ /	70	25.	STEEL	49 - 100		- -	Y	HOME
0147SW 6	92000562	(b) (6) (b) (6)	01/02/1992	165	25	125	OPEN	GOOD	- -		00622
BLOUNT		NAILS CREEK RD	/ /	138	57	STEEL	125 - 165		- -	Y	HOME
0147SW 6	92002479	(b) (6) (b) (6)	04/17/1992	930	0	158	OPEN	OTHR	- -		00264
BLOUNT			/ /	--	0	STEEL	158 - 930		- -	Y	HOME
0147SW 6	92002480	(b) (6) (b) (6)	04/17/1992	325	4	66	OPEN	UNK	- -		00264
BLOUNT			/ /	100	10	STEEL	66 - 325		- -	Y	HOME
0147SW 6	92003411	(b) (6) (b) (6)	09/02/1992	350	20	105	OPEN	OTHR	- -		00383
BLOUNT		CRESTNUT RIDGE	/ /	325	40	STEEL	105 - 350		- -	Y	HOME
0147SW 6	92004007	(b) (6) (b) (6)	09/15/1992	230	30	105	OPEN	OTHR	- -		00383
BLOUNT		GLOVER	/ /	205	60	STEEL	105 - 230		- -	Y	HOME
0147SW 6	93002408	(b) (6) (b) (6)	03/10/1993	425	15	84	OPEN	OTHR	- -		00383
BLOUNT		MARTIN MILL PK	/ /	350	70	STEEL	84 - 425		- -	Y	HOME
0147SW 6	94004053	(b) (6) (b) (6)	09/26/1994	120	60	85	OPEN	OTHR	35-49-16	S	00385
BLOUNT	D0007944	MARTIN MILL 822	6/ 6/1995	95	30	STEEL	85 - 120	008839	83-54-20	Y	HOME
0147SW 6	94004364	(b) (6) (b) (6)	11/08/1994	205	20	59	OPEN	UNK	- -		00536
BLOUNT	D0008284	NORTH WILDWOOD	/ /	150	55	STEEL	59 - 205		- -	Y	HOME
0147SW 6	94004682	(b) (6) (b) (6)	10/25/1994	550	7	179	OPEN	GOOD	35-49-18	S	00622
BLOUNT	D0010051	MARTIN MILL PIK	6/ 6/1995	190	94	STEEL	179 - 550	008840	83-53-49	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH	WELL NUM	OWNER'S NAME	COMP DATE	TOT DEPTH	TOT YIELD	CSE DEPTH	WELL FINISH	WAT QUAL	LATITUDE	A/C	DRILLER
COUNTY	REG NUM	LOCATION ROAD	INSPT DATE	AQ DEPTH	STAT LEVEL	CSE TYPE	INTERVAL	TAG NUM	LONGITUDE	LOG	USE
0147SW 6	95000959	(b) (6) (b) (6)	01/02/1995	310	5	41		OTHR	35-39-45	F	00526
BLOUNT	D0010176	HOLLYBROOK 3742	6/ 6/1995	175	--	STEEL	41 - 310	008837	83-54-33	Y	HOME
0147SW 6	95002772	(b) (6) (b) (6)	06/09/1995	421	60	354	OPEN	OTHR	- -		00385
BLOUNT	D0007883	LYNNWOOD RD	/ /	405	150	STEEL	354 - 421		- -	Y	HOME
0147SW 6	95004784	(b) (6) (b) (6)	09/25/1995	210	10	42		OTHR	- -		00383
BLOUNT	D0014254	GLOVER	/ /	140	40	STEEL	42 - 210		- -	Y	HOME
0147SW 6	95005004	(b) (6) (b) (6)	10/12/1995	225	75	146	OPEN	GOOD	- -		00264
BLOUNT	D0014727		/ /	160	20	STEEL	146 - 225		- -	Y	HOME
0147SW 6	95005006	(b) (6) (b) (6)	10/16/1995	345	--	193	OPEN	GOOD	- -		00264
BLOUNT	D0014728		/ /	250	30	STEEL	193 - 345		- -	Y	HOME
0147SW 6	96000998	(b) (6) (b) (6)	03/07/1996	665	7	20	OPEN	UNK	- -		00536
BLOUNT	D0016404	MARTIN MILL PIK	/ /	440	60	STEEL	20 - 665		- -	Y	HOME
0147SW 7	00901011	ALCOA	08/01/1981	73	--	52			35-46-58	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-10		IND
0147SW 7	00901012	ALCOA	07/31/1981	--	--	6			35-47-10	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-23		IND
0147SW 7	00901013	ALCOA	07/31/1981	--	--	43			35-47-09	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-23		IND
0147SW 7	00901014	ALCOA	07/30/1981	48	--	6			35-47-07	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-11		IND
0147SW 7	00901015	ALCOA	07/29/1981	75	--	60			35-47-05	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-10		IND
0147SW 7	00901016	ALCOA	07/28/1981	39	--	21			35-47-13	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-20		IND
0147SW 7	00901017	ALCOA	07/28/1981	70	--	46			35-47-12	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-18		IND
0147SW 7	00901018	ALCOA	07/27/1981	50	--	21			35-46-59	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-11		IND
0147SW 7	00901019	ALCOA	07/27/1981	66	--	52			35-46-57	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-32		IND
0147SW 7	00901020	ALCOA	07/24/1981	60	--	22			35-46-56	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-30		IND

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE MARYVILLE QUADRANGLE (0147SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147SW 7	00901021	ALCOA	07/23/1981	60	--	52			35-46-56	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-26		IND
0147SW 7	00901022	ALCOA	07/22/1981	20	--	25			35-46-51	S	00385
BLOUNT			/ /	--	--	STEEL	-- - --		83-58-25		IND
0147SW 7	00901579	(b) (6) ____ (b) (6)	07/13/1987	200	15	105	OPEN	OTHR	- -		00383
BLOUNT		DISCO	/ /	145	60	STEEL	105 - 200		- -	Y	HOME
0147SW 7	00901724	(b) (6) ____ (b) (6)	08/27/1988	145	30	98	OPEN	OTHR	- -		00383
BLOUNT		RIO VISTA	/ /	135	40	STEEL	98 - 145		- -	Y	HOME
0147SW 7	92000020	(b) (6) ____ (b) (6)	11/01/1991	310	--	--	OPEN	GOOD	- -		00031
BLOUNT		GLOVER 1219	/ /	--	--	STEEL	-- - --		- -	Y	HOME
0147SW 8	00901195	(b) (6) ____ (b) (6)	09/22/1982	85	10	23	OPEN	GOOD	- -		00383
BLOUNT		MARSHALL	/ /	30	21	STEEL	23 - 85		- -	Y	HOME
0147SW 8	00901402	(b) (6) ____ (b) (6)	09/18/1985	225	25	70	OPEN	OTHR	- -		00383
BLOUNT		SERVILLE	/ /	126	--	STEEL	70 - 225		- -	Y	HOME
0147SW 8	00901630	(b) (6) ____ (b) (6)	06/22/1988	145	20	90	OPEN	GOOD	- -		00608
BLOUNT		HWY 33	/ /	130	40	STEEL	90 - 145		- -	Y	HOME
0147SW 8	09302147	(b) (6) ____ (b) (6)	05/15/1989	530	4	42	OPEN	OTHR	- -		00152
KNOX		PATTY	/ /	200	180	STEEL	42 - 530		- -	N	HOME
0147SW 8	95002777	(b) (6) ____ (b) (6)	05/30/1995	241	40	104	OPEN	OTHR	- -		00385
BLOUNT	D0007881	HAZENWOOD	/ /	155	--	STEEL	104 - 241		- -	Y	HOME
0147SW 9	00901469	(b) (6) ____ (b) (6)	09/08/1986	145	12	120	OPEN	GOOD	- -		00622
BLOUNT		DAVIS FORD	/ /	124	88	STEEL	120 - 145		- -	Y	HOME
0147SW 9	00901705	(b) (6) ____ (b) (6)	10/12/1988	165	10	73	OPEN	OTHR	- -		00608
BLOUNT		TUCKALEECHEE DR	/ /	140	40	STEEL	73 - 165		- -	Y	HOME
0147SW 9	00901752	(b) (6) ____ (b) (6)	04/23/1989	350	10	56	OPEN	OTHR	- -		00383
BLOUNT		HELTON	/ /	327	60	STEEL	56 - 350		- -	Y	HOME
0147SW 9	92002313	(b) (6) ____ (b) (6)	11/22/1991	190	25	42	OPEN	UNK	- -		00383
BLOUNT		PINEY GROVE	/ /	175	15	STEEL	42 - 190		- -	Y	HOME
0147SW 9	92003404	(b) (6) ____ (b) (6)	06/03/1992	125	20	41	OPEN	OTHR	- -		00383
BLOUNT		DAVIS FORD	/ /	100	90	STEEL	41 - 125		- -	Y	HOME
0147SW 9	96000102	(b) (6) ____ (b) (6)	10/16/1995	520	3	59	OPEN	OTHR	- -		00385
BLOUNT	D0007915	BLAZIER RD	/ /	256	--	STEEL	59 - 520		- -	Y	HOME

REFERENCE

" Water Wells on the Shooks Gap Quadrangle "

TDEC/DWS. 1997c. Records of Water Wells on the Shooks Gap Quadrangle (0147NE) TN. November 12. pp.:1-12.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT AQ	DEPTH DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NE 1 KNOX	09300148	(b) (6)	11/04/1964 / /	94 50		5 --	20 STEEL	 -- - --		- - - -		00031 HOME
0147NE 1 KNOX	09301510		06/05/1981 / /	150 100		10 25	21 STEEL	 -- - --	GOOD	35-58-19 83-51-45	S	00115 HOME
0147NE 1 KNOX	09301620		09/00/1982 / /	320 --		20 --	80 STEEL	 -- - --	GOOD	35-58-12 83-51-34	S	00138 HOME
0147NE 1 KNOX	09301637	(b) (6) (b) (6) RIVERSHORE1659	02/02/1983 / /	125 115		25 30	51 STEEL	 -- - --	BAD	35-59-19 83-50-53	S	00385
0147NE 1 KNOX	09301728	(b) (6) (b) (6) 2134 ASBURY RD	01/04/1984 / /	280 260		60 --	21 STEEL	OPEN 21 - 280	GOOD	35-57-30 83-50-00	M Y	00264 HEAT
0147NE 1 KNOX	09301729	(b) (6) (b) (6) 2134 ASBURY RD	01/03/1984 / /	530 350		7 --	21 STEEL	OPEN 21 - 530	GOOD	35-57-30 83-50-00	M Y	00264
0147NE 1 KNOX	09301771	(b) (6) (b) (6) RIVER BEND	06/11/1984 / /	350 340		100 80	105 STEEL	OPEN 105 - 350	GOOD	- - - -	 Y	00383 HOME
0147NE 1 KNOX	09309141	(b) (6) 0-17917	/ /19 / /	120 108		-- 15	30	 -- - --	GOOD	35-58-23 83-52-18	S	 HOME
0147NE 1 KNOX	09309142	(b) (6) 0-17917	/ /19 / /	110 --		-- 16	25	 -- - --	UNK	35-58-20 83-52-06	S	 HOME
0147NE 1 KNOX	09309149	(b) (6) 0-161-16	/ /19 / /	225 --		-- --	-- STEEL	 -- - --	UNK	35-59-00 83-51-12	S	 HOME
0147NE 1 KNOX	09309150	(b) (6) SR 0-159	/ /19 / /	150 --		-- 30	40	 -- - --	UNK	35-58-01 83-50-40	S	 OTHR
0147NE 1 KNOX	90000733	(b) (6) (b) (6) WEIGEL LN	03/08/1990 / /	283 151		12 4	62 STEEL	OPEN 62 - 283	UNK	- - - -	 Y	00385 HOME
0147NE 1 KNOX	97000077 D0022600	(b) (6) (b) (6) ARCHIE WIEGEL	12/08/1996 / /	625 425		4 200	89 STEEL	OPEN 89 - 625	UNK	- - - -	 Y	00536 HOME
0147NE 1 KNOX	97002736 D0027152	AMERICAN BUILDERS O P PICKLE	07/16/1997 / /	510 410		8 180	63 STEEL	OPEN 63 - 510	OTHR	- - - -	 Y	00115 HOME
0147NE 2 KNOX	09300203	(b) (6)	08/25/1965 / /	84 80		30 20	39 STEEL	 -- - --		- - - -		00216 HOME
0147NE 2 KNOX	09300457		11/24/1968 / /	130 45		10 45	20 STEEL	 -- - --	GOOD	35-58-57 83-49-10	S	00153 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE).TN.

QUAD / NTH / COUNTY	WELL NUM / REG NUM	OWNER'S NAME / LOCATION ROAD	COMP DATE / INSPT DATE	TOT DEPTH / AQ DEPTH	TOT YIELD / STAT LEVEL	CSE DEPTH / CSE TYPE	WELL FINISH INTERVAL	WAT QUAL / TAG NUM	LATITUDE / LONGITUDE	A/C LOG	DRILLER / USE
0147NE 2	09301616	(b) (6)	09/08/1982	145	15	61		GOOD	35-59-06	S	00385
KNOX			/ /	117	40	STEEL	-- - --		83-48-43		HOME
0147NE 2	09301720	(b) (6) (b) (6)	11/03/1983	180	3	63	OPEN	OTHR	35-55-00	M	00138
KNOX		JOHN SEVIER	/ /	140	--	STEEL	63 - 180		83-45-00	N	HOME
0147NE 2	09301747	(b) (6) (b) (6)	07/03/1984	220	3	94	OPEN	GOOD	- -		00138
KNOX		PERRY RD	/ /	200	--	STEEL	94 - 220		- -	Y	HOME
0147NE 2	09302080	(b) (6) (b) (6)	06/06/1988	150	20	20	OPEN	GOOD	- -		00031
KNOX		PRATE RD	/ /	121	21	STEEL	-- - --		- -	Y	HOME
0147NE 2	09309143	(b) (6) (b) (6)	/ /19	51	--	--	OPEN	UNK	35-59-28	S	00000
KNOX		MOSHINA RD	/ /	--	20	STEEL	14 - 51		83-47-52	N	HOME
0147NE 2	09309145	(b) (6) 1680-16	/ /19	122	--	6		UNK	35-58-06	S	
KNOX			/ /	--	40		-- - --		83-47-54		HOME
0147NE 2	09309146	(b) (6) 0-16716	/ /19	60	10	--		UNK	35-58-48	S	
KNOX			/ /	--	2		-- - --		83-49-18		IND
0147NE 2	09309147	(b) (6) 0-16716	/ /19	100	35	--		UNK	35-58-48	S	
KNOX			/ /	100	--		-- - --		83-49-18		
0147NE 2	09309148	(b) (6) 0-16	/ /19	104	--	--		UNK	35-59-34	S	
KNOX			/ /	102	20		-- - --		83-49-42		HOME
0147NE 2	95005784	(b) (6) (b) (6)	12/08/1995	210	10	41	OPEN	GOOD	- -		00667
KNOX	D0015890	BELLA VISTA LAN	/ /	90	50	STEEL	41 - 210		- -	Y	HOME
0147NE 3	09300353	(b) (6)	07/27/1967	132	20	77		GOOD	35-59-13	S	00385
KNOX			/ /	130	75	STEEL	-- - --		83-45-26		HOME
0147NE 3	09300367	(b) (6)	12/04/1968	770	2	60		GOOD	35-59-04	S	00152
KNOX		KODACK OFF	/ /	760	500	STEEL	-- - --		83-44-59		HOME
0147NE 3	09300456	(b) (6)	10/15/1968	225	--	20		GOOD	35-59-00	S	00153
KNOX			/ /	95	95	STEEL	-- - --		83-46-42		HOME
0147NE 3	09300584		00/00/1970	212	20	123		GOOD	35-59-24	S	00182
KNOX			/ /	190	--	STEEL	-- - --		83-45-05		--
0147NE 3	09301189		10/25/1977	400	10	110		GOOD	35-59-07	S	00031
KNOX			/ /	365	80	STEEL	-- - --		83-45-18		HOME
0147NE 3	09301623		00/00/1982	280	5	72		GOOD	35-59-16	S	
KNOX			/ /	--	60	STEEL	-- - --		83-46-29		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / COUNTY	NTH	WELL NUM / REG NUM	OWNER'S NAME / LOCATION ROAD	COMP DATE / INSPT DATE	TOT DEPTH / AQ DEPTH	TOT YIELD / STAT LEVEL	CSE DEPTH / CSE TYPE	WELL FINISH / INTERVAL	WAT QUAL / TAG NUM	LATITUDE / LONGITUDE	A/C LOG	DRILLER / USE
0147NE	3	09301926	(b) (6) (b) (6)	02/12/1987	410	3	42	OPEN	OTHR	- -		00115
KNOX			NORWOOD	/ /	410	300	STEEL	42 - 410		- -	Y	HOME
0147NE	3	09308001	NO NAME	/ /19	--	10	--		GOOD	35-59-25	S	
KNOX				/ /	--	--		-- - --		83-52-07		FARM
0147NE	3	09308003	(b) (6) GS G	/ /19	--	20	--		GOOD	35-57-46	S	
KNOX				/ /	--	--		-- - --		83-45-54		FARM
0147NE	3	09309144	(b) (6) (b) 0-169	/ /19	168	5	147		GOOD	35-59-21	S	
KNOX				/ /	--	96		-- - --		83-45-58		HOME
0147NE	3	09309154	(b) (6) 0-14814	/ /19	116	--	--		UNK	35-57-30	S	
KNOX				/ /	--	50		-- - --		83-46-15		HOME
0147NE	3	09309161	(b) (6)	00/00/1940	200	25	35		GOOD	35-57-49	S	
KNOX				/ /	170	30	STEEL	-- - --		83-45-49		FARM
0147NE	3	15500496		04/09/1966	122	3	10		GOOD	35-57-34	S	00154
SEVIER				/ /	60	55	STEEL	-- - --		83-45-11		FARM
0147NE	3	15500497		05/13/1966	100	5	21			35-57-48	S	00154
SEVIER				/ /	80	60	STEEL	-- - --		83-45-44		HOME
0147NE	3	15500541		08/05/1966	300	12	70		GOOD	35-57-50	S	00152
SEVIER				/ /	285	110	STEEL	-- - --		83-46-01		HOME
0147NE	3	15500593		07/21/1966	154	10	17		UNK	35-57-39	S	00078
SEVIER				/ /	145	40	STEEL	-- - --		83-45-33		HOME
0147NE	3	93000261	(b) (6) (b) (6)	08/15/1992	205	75	61		OTHR	- -		00264
KNOX				/ /	115	25	STEEL	62 - 205		- -	Y	HOME
0147NE	3	95000728	(b) (6) (b) (6)	02/01/1995	225	15	146	OPEN	UNK	- -		00264
KNOX		D0009436		/ /	160	80	STEEL	146 - 225		- -	Y	HOME
0147NE	3	97000378	(b) (6) (b) (6)	01/02/1997	401	20	84	OPEN	OTHR	- -		00385
KNOX		D0022219	JOHN SEVIER HIG	/ /	152	--	STEEL	84 - 401		- -	Y	HOME
0147NE	4	09300132	(b) (6)	09/15/1964	100	10	25			- -		00031
KNOX				/ /	60	35	STEEL	-- - --		- -		
0147NE	4	09300321		04/20/1967	354	12	50		GOOD	35-55-25	S	00385
KNOX				/ /	317	165	STEEL	-- - --		83-50-15		HOME
0147NE	4	09300390	(b) (6)	02/17/1968	190	--	21		GOOD	- -		00241
KNOX			DANIEL LN4217	/ /	40	150	STEEL	-- - --		- -		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NE 4 KNOX	09301672	(b) (6) (b) (6) BURNETTE CREEK	06/02/1983 08/08/1983	165 40	2 42	34 STEEL	OPEN 34 - 165	GOOD	35-56-08 83-50-23	S Y	00385 HOME
0147NE 4 KNOX	09301881	(b) (6) (b) (6) FRAZER RD	01/14/1986 / /	200 168	11 50	20 STEEL	OPEN 20 - 200	GOOD	- - - -	 Y	00031 HOME
0147NE 4 KNOX	09309152	(b) (6) 0-1525	/ /19 / /	120 --	-- 60	--	 -- - --	UNK	35-55-34 83-51-35	S	 HOME
0147NE 4 KNOX	94005048 D0007857	(b) (6) (b) (6) NIXON ROAD	11/31/1994 / /	301 87	6 --	70 STEEL	OPEN 70 - 301	OTHR	- - - -	 Y	00385 HOME
0147NE 5 KNOX	09300030	(b) (6)	11/04/1963 / /	111 --	-- 66	21 STEEL	 -- - --	GOOD	35-57-05 83-48-13	S	00241 HOME
0147NE 5 KNOX	09300198		08/19/1965 / /	151 140	-- 50	59 STEEL	 -- - --	GOOD	35-56-06 83-48-00	S	00293 HOME
0147NE 5 KNOX	09300218		10/28/1965 / /	145 125	-- 60	27 STEEL	 -- - --	GOOD	35-55-20 83-48-49	S	00293 HOME
0147NE 5 KNOX	09300240		03/23/1966 / /	339 --	-- 120	121 STEEL	 -- - --	GOOD	35-57-05 83-48-10	S	00241 HOME
0147NE 5 KNOX	09301368	TUCKER FABRICATORS	05/24/1979 / /	130 105	30 --	33 STEEL	 -- - --	GOOD	- - - -		00264 COMM
0147NE 5 KNOX	09301509	NEW HOPEWELL B.CH.	06/09/1981 / /	610 384	30 30	21 STEEL	 -- - --	GOOD	35-55-43 83-48-05	S	00385
0147NE 5 KNOX	09301551	BURLAH METHODIST CH	12/30/1981 / /	250 222	55 40	42 STEEL	 -- - --	GOOD	35-55-43 83-48-25	S	00385
0147NE 5 KNOX	09301552	NEW HOPEWELL CHURCH	09/10/1981 / /	518 --	-- --	21 STEEL	 -- - --	GOOD	35-55-44 83-48-03	S	00385 MDOM
0147NE 5 KNOX	09301553	NEW HOPEWELL B.CH.	09/08/1981 / /	579 553	30 --	42 STEEL	 -- - --	GOOD	35-55-44 83-48-06	S	00385 MDOM
0147NE 5 KNOX	09301600	(b) (6)	06/18/1982 / /	272 205	-- 62	41 STEEL	 -- - --	GOOD	35-56-40 83-47-44	S	00385 HOME
0147NE 5 KNOX	09301615		08/15/1982 / /	475 175	3 120	41 STEEL	 -- - --	GOOD	35-55-02 83-48-34	S	00385 HOME
0147NE 5 KNOX	09301666	(b) (6) (b) (6) OLD FRENCH	04/08/1983 08/08/1983	969 126	-- 61	118 STEEL	OPEN 118 - 969	GOOD	35-57-08 83-48-07	S Y	00385 OTHR

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE). TN.

QUAD / COUNTY	NTH	WELL NUM / REG NUM	OWNER'S NAME / LOCATION ROAD	COMP DATE / INSPT DATE	TOT DEPTH / AQ DEPTH	TOT YIELD / STAT LEVEL	CSE DEPTH / CSE TYPE	WELL FINISH / INTERVAL	WAT QUAL / TAG NUM	LATITUDE / LONGITUDE	A/C LOG	DRILLER / USE
0147NE	5	09301878	(b) (6) (b) (6)	03/18/1986	350	1	33	OPEN	OTHR	- -		00115
KNOX			NORWOOD RD	/ /	350	40	STEEL	33 - 350		- -	Y	HOME
0147NE	5	09301957	(b) (6) (b) (6)	03/03/1987	105	40	52	OPEN	GOOD	- -		00622
KNOX			FORD TOWN RD	/ /	96	47	STEEL	-- - --		- -	Y	HOME
0147NE	5	09309151	(b) (6) 0-154-15	/ /19	78	--	30		UNK	36-56-08	S	
KNOX				/ /	--	32		-- - --		83-49-45		HOME
0147NE	5	09309153	(b) (6) 0-15015	/ /19	70	--	25		UNK	36-55-23	S	
KNOX				/ /	--	40	STEEL	-- - --		83-48-56		HOME
0147NE	5	09309162	(b) (6)	00/00/1948	270	15	40		GOOD	35-55-24	S	
KNOX				/ /	220	65	STEEL	-- - --		83-55-24		HOME
0147NE	5	09309163	(b) (6)	00/00/1950	167	25	20		GOOD	35-55-26	S	
KNOX				/ /	60	20	STEEL	-- - --		83-47-44		OTHR
0147NE	5	90000493	(b) (6) (b) (6)	10/02/1988	265	60	73	OPEN	H2S	- -		00385
KNOX			JOHN SEVIER HWY	/ /	151	2	STEEL	73 - 265		- -	Y	HEAT
0147NE	5	93004751	(b) (6) (b) (6)	09/14/1993	162	60	--	OPEN	GOOD	35-56-27	S	00385
KNOX			NEW FRENCH RD	4/28/1994	95	30	STEEL	-- - --	008300	83-47-42	N	HOME
0147NE	5	94005044	(b) (6) (b) (6)	11/21/1994	140	12	63	OPEN	OTHR	- -		00385
KNOX		D0007851	DAVIS ROAD	/ /	105	--	STEEL	63 - 140		- -	Y	HOME
0147NE	5	95002774	(b) (6) (b) (6)	05/12/1995	660	4	21	OPEN	OTHR	- -		00385
KNOX		D0007878	FRENCH RD	/ /	330	160	STEEL	21 - 660		- -	Y	HOME
0147NE	5	95004015	(b) (6) (b) (6)	08/14/1995	180	30	42	OPEN	OTHR	- -		00385
KNOX		D0007897	DEADRICK ROAD	/ /	90	--	STEEL	42 - 180		- -	Y	HOME
0147NE	5	96004997	(b) (6) (b) (6)	10/31/1996	300	15	21	OPEN	UNK	35-55-37	S	00684
KNOX		D0018675	KIMBERLIN HGTS	2/16/1997	180	100	STEEL	21 - 300	018345	83-47-37	Y	HOME
0147NE	5	97001025	(b) (6) (b) (6)	03/04/1997	201	25	49	OPEN	OTHR	- -		00385
KNOX		D0020205	JOHN SEVIER HIG	/ /	62	--	STEEL	49 - 201		- -	Y	HOME
0147NE	5	97003329	(b) (6) (b) (6)	05/08/1997	280	20	42	OPEN	OTHR	- -		00385
KNOX		D0022177	OLD FRENCH RD	/ /	265	--	STEEL	42 - 280		- -	Y	HOME
0147NE	5	97003334	(b) (6) (b) (6)	06/12/1997	100	25	31	OPEN	OTHR	- -		00385
KNOX		D0022182	JOHN SEVIER HWY	/ /	36	--	STEEL	31 - 100		- -	Y	HOME
0147NE	6	09300027	(b) (6)	08/25/1963	80	--	10			35-55-55	S	00093
KNOX				/ /	--	20	STEEL	-- - --		83-46-10		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / NTH *COUNTY*	WELL NUM *REG NUM*	OWNER'S NAME *LOCATION ROAD*	COMP DATE *INSPT DATE*	TOT DEPTH *AQ DEPTH*	TOT YIELD *STAT LEVEL*	CSE DEPTH *CSE TYPE*	WELL FINISH *INTERVAL*	WAT QUAL *TAG NUM*	LATITUDE *LONGITUDE*	A/C *LOG*	DRILLER *USE*
0147NE 6	09300028	(b) (6)	08/15/1963	90	--	36			35-55-03	S	00093
KNOX			/ /	--	35	STEEL	-- - --		83-46-53		HOME
0147NE 6	09300037		12/18/1963	112	--	23		GOOD	35-55-20	S	00241
KNOX			/ /	--	40	STEEL	-- - --		83-45-20		HOME
0147NE 6	09300059		04/20/1964	235	25	112			35-57-25	S	00138
KNOX			/ /	210	160	STEEL	-- - --		83-46-05		HOME
0147NE 6	09300060		04/16/1964	110	10	44			35-55-10	S	00031
KNOX			/ /	80	--	STEEL	-- - --		83-45-55		HOME
0147NE 6	09300080		07/07/1964	87	--	21			- -		00031
KNOX		NEWHOPEWELL	/ /	--	20	STEEL	-- - --		- -		HOME
0147NE 6	09300093	(b) (6)	08/07/1964	160	--	34		GOOD	35-55-33	S	00241
KNOX			/ /	--	75	STEEL	-- - --		83-45-58		HOME
0147NE 6	09300094		08/13/1964	165	--	25		GOOD	35-56-22	S	00241
KNOX			/ /	--	80	STEEL	-- - --		83-45-55		HOME
0147NE 6	09300210		09/22/1965	164	--	37		GOOD	35-56-25	S	00293
KNOX			/ /	150	50	STEEL	-- - --		83-45-53		HOME
0147NE 6	09300217		11/04/1965	210	--	23		GOOD	35-56-06	S	00293
KNOX			/ /	205	70	STEEL	-- - --		83-46-11		HOME
0147NE 6	09300219		11/08/1965	112	--	45		GOOD	35-55-50	S	00293
KNOX			/ /	105	72	STEEL	-- - --		83-45-47		HOME
0147NE 6	09300224		11/17/1965	165	--	39		GOOD	35-55-25	S	00293
KNOX			/ /	160	70	STEEL	-- - --		83-46-10		HOME
0147NE 6	09300225	(b) (6)	11/27/1965	202	--	18		GOOD	- -		00293
KNOX		KIMBERLIN HEIGHT	/ /	190	80	STEEL	-- - --		- -		HOME
0147NE 6	09300230	(b) (6)	01/20/1966	135	--	23		GOOD	35-56-32	S	00241
KNOX			/ /	--	65	STEEL	-- - --		83-45-49		HOME
0147NE 6	09300329		04/19/1967	376	--	144		GOOD	35-55-33	S	00293
KNOX			/ /	265	20	STEEL	-- - --		83-45-56		HOME
0147NE 6	09300352		08/03/1967	117	20	54		GOOD	35-56-57	S	00385
KNOX			/ /	105	--	STEEL	-- - --		83-47-11		HOME
0147NE 6	09300356		09/08/1967	127	--	45		GOOD	35-56-47	S	00293
KNOX			/ /	115	30	STEEL	-- - --		83-45-56		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NE 6	09300449	(b) (6)	11/09/1968	107	--	44		GOOD	35-55-49	S	00293
KNOX			/ /	95	20	STEEL	-- - --		83-45-35		HOME
0147NE 6	09300450		11/01/1968	125	--	35		GOOD	35-55-49	S	00293
KNOX			/ /	120	50	STEEL	-- - --		83-45-35		HOME
0147NE 6	09300596		08/20/1970	93	--	28		GOOD	35-55-32	S	00293
KNOX			/ /	80	40	STEEL	-- - --		83-46-29		HOME
0147NE 6	09300599		07/10/1970	293	--	25		GOOD	35-55-27	S	00293
KNOX			/ /	285	80	STEEL	-- - --		83-46-56		HOME
0147NE 6	09300625		11/29/1970	115	16	30			35-56-34	S	00241
KNOX			/ /	95	40	STEEL	-- - --		83-46-18		HOME
0147NE 6	09300626		12/21/1970	100	18	22			35-56-33	S	00241
KNOX			/ /	85	45	STEEL	-- - --		83-46-15		HOME
0147NE 6	09300662		11/01/1971	328	3	56		GOOD	35-55-21	S	00028
KNOX			/ /	300	67	STEEL	-- - --		83-46-23		HOME
0147NE 6	09301586		06/10/1982	340	8	60		GOOD	35-55-54	S	00138
KNOX			/ /	320	75	STEEL	-- - --		83-45-35		HOME
0147NE 6	09301614		08/05/1982	270	25	42		GOOD	35-55-55	S	00385
KNOX			/ /	257	35	STEEL	-- - --		83-45-40		HOME
0147NE 6	09301704	(b) (6) ________ (b) (6)	08/08/1983	251	6	62	OPEN	GOOD	35-55-37	S	00385
KNOX		LUNDY LANE	12/29/1983	160	160	STEEL	62 - 251		83-46-53	Y	HOME
0147NE 6	09302086	(b) (6) ________ (b) (6)	05/31/1988	510	3	62	OPEN	GOOD	- -		00536
KNOX		HOLSTON RIVER R	/ /	250	80	STEEL	62 - 510		- -	Y	HOME
0147NE 6	09309155	(b) (6) 0-147 0-14	/ /19	110	--	18		UNK	35-56-08	S	
KNOX			/ /	110	20		-- - --		83-47-04		HOME
0147NE 6	09309156	NO NAME	/ /19	142	20	42		UNK	35-55-49	S	
KNOX			/ /	120	20	STEEL	-- - --		83-45-06		HOME
0147NE 6	09309164	(b) (6)	00/00/1955	66	15	20		GOOD	35-55-20	S	
KNOX			/ /	50	30	STEEL	-- - --		83-47-26		HOME
0147NE 6	09309165		00/00/1952	129	20	19		GOOD	35-56-44	S	
KNOX			/ /	65	110	STEEL	-- - --		83-46-09		FARM
0147NE 6	09309166		00/00/1940	110	10	40		GOOD	35-55-30	S	
KNOX			/ /	85	60	STEEL	-- - --		83-45-59		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / NTH	WELL NUM	OWNER'S NAME	COMP DATE	TOT DEPTH	TOT YIELD	CSE DEPTH	WELL FINISH	WAT QUAL	LATITUDE	A/C	DRILLER
COUNTY	REG NUM	LOCATION ROAD	INSPT DATE	AQ DEPTH	STAT LEVEL	CSE TYPE	INTERVAL	TAG NUM	LONGITUDE	LOG	USE
0147NE 6	90000481	(b) (6) (b) (6)	07/26/1989	501	11	62	OPEN	OTHR	- -		00385
KNOX		HODGES FERRY RD	/ /	342	31	STEEL	62 - 501		- -	Y	HOME
0147NE 6	90000498	(b) (6) (b) (6)	12/07/1989	202	17	142	OPEN	OTHR	- -		00385
KNOX		KIMBERLIN HGTS	/ /	125	5	STEEL	142 - 202		- -	Y	HOME
0147NE 6	90001083	(b) (6) (b) (6)	03/13/1990	230	12	20	OPEN	GOOD	- -		00031
KNOX		8814 BERYL LANE	/ /	101	9	STEEL	20 - 230		- -	Y	HOME
0147NE 6	90003598	(b) (6) (b) (6)	05/10/1990	410	15	104	OPEN	UNK	- -		00264
KNOX			/ /	370	100	STEEL	104 - 410		- -	Y	HOME
0147NE 6	91001166	(b) (6) (b) (6)	04/18/1991	140	6	41	OPEN	GOOD	- -		00692
KNOX		DOTSON RD	/ /	110	10	STEEL	-- - --		- -	Y	HOME
0147NE 6	92002425	(b) (6) (b) (6)	06/01/1992	460	10	104	OPEN	GOOD	- -		00536
KNOX			/ /	260	60	STEEL	104 - 460		- -	Y	HOME
0147NE 6	93002870	(b) (6) (b) (6)	06/29/1993	405	4	20	OPEN	OTHR	- -		00264
KNOX		SEVIERVILLE PK	/ /	340	180	STEEL	20 - 405		- -	Y	HOME
0147NE 6	93002964	(b) (6) (b) (6)	07/10/1993	184	15	84	OPEN	GOOD	- -		00152
SEVIER		PROVIDENCE	/ /	150	85	STEEL	84 - 184		- -	Y	HOME
0147NE 6	94003273	RIDGEWAY BAPTIST CH	03/17/1994	265	10	148	OPEN	GOOD	- -		00692
KNOX	D0006546	3515 KIMBERLING	/ /	140	--	STEEL	148 - 265		- -	Y	HOME
0147NE 6	95005174	(b) (6) (b) (6)	10/09/1995	120	20	69	OPEN	OTHR	- -		00385
KNOX	D0007912	HANKINS ROAD	/ /	81	48	STEEL	69 - 120		- -	Y	HOME
0147NE 6	96002935	(b) (6) (b) (6)	06/25/1996	205	30	99	OPEN	UNK	- -		00536
KNOX	D0018585	WEIGEL LN	/ /	180	60	STEEL	99 - 205		- -	Y	HOME
0147NE 6	97001389	(b) (6) (b) (6)	04/24/1997	645	20	175	OPEN	OTHR	- -		00264
KNOX	D0023578	KIMBERLIN HGTS	/ /	200	115	STEEL	175 - 645		- -	Y	HOME
0147NE 7	09300357	(b) (6)	09/21/1967	214	2	155		GOOD	- -		00385
KNOX		NEUBERTSQUARRY	/ /	175	150	STEEL	33 - 78		- -		HOME
0147NE 7	09300487	(b) (6)	04/19/1969	115	--	22		GOOD	35-53-50	S	00241
KNOX			/ /	18	97	STEEL	-- - --		83-52-07		HOME
0147NE 7	09300496	(b) (6)	05/23/1969	160	75	21		GOOD	- -		00028
KNOX		THOMPSON SCHOOL	/ /	145	30	STEEL	-- - --		- -		HOME
0147NE 7	09301250	(b) (6) (b) (6)	07/00/1978	200	5	43		GOOD	35-53-08	S	00138
KNOX		TARWATER	/ /	--	50	STEEL	-- - --		83-51-55		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / COUNTY	NTH	WELL NUM / REG NUM	OWNER'S NAME / LOCATION ROAD	COMP DATE / INSPT DATE	TOT DEPTH / AQ DEPTH	TOT YIELD / STAT LEVEL	CSE DEPTH / CSE TYPE	WELL FINISH INTERVAL	WAT QUAL / TAG NUM	LATITUDE / LONGITUDE	A/C LOG	DRILLER / USE
0147NE	7	09301772	(b) (6) (b) (6)	02/14/1983	250	4	63	OPEN	GOOD	- -		00383
KNOX			PRATER	/ /	155	60	STEEL	63 - 250		- -	Y	HOME
0147NE	7	09301847	(b) (6) (b) (6)	10/15/1985	195	6	21	OPEN	OTHR	- -		00115
KNOX			TARKLIN VALLEY	/ /	195	150	STEEL	21 - 195		- -	Y	HOME
0147NE	7	09308005	NEUBERT SULPHUR SPR	/ /19	--	100	--		GOOD	- -		
KNOX				/ /	--	--		-- - --		- -		
0147NE	7	09309158	(b) (6) 0-1420-14	/ /19	70	--	30		UNK	35-52-54	S	
KNOX				/ /	--	30	STEEL	-- - --		83-50-45		HOME
0147NE	7	09309159	(b) (6) 0-1410-14	/ /19	92	--	16		UNK	35-53-49	S	
KNOX				/ /	65	30	STEEL	-- - --		83-52-24		
0147NE	7	09309168	(b) (6)	00/00/1957	360	50	40		GOOD	35-53-09	S	
KNOX				/ /	340	90	STEEL	-- - --		83-50-10		FARM
0147NE	7	09309169		00/00/1952	52	500	20		GOOD	35-52-58	S	
KNOX				/ /	20	30	STEEL	-- - --		83-50-08		FARM
0147NE	7	90000472	(b) (6) (b) (6)	06/20/1989	245	100	126	OPEN	OTHR	- -		00385
KNOX			JOHN SEVIER HWY	/ /	197	6	STEEL	126 - 245		- -	Y	IRR
0147NE	7	90000727	(b) (6) (b) (6)	06/20/1989	245	60	125	OPEN	UNK	- -		00385
KNOX			JOHN SEVIER HWY	/ /	130	4	STEEL	125 - 245		- -	Y	IRR
0147NE	7	93001052	(b) (6) (b) (6)	11/12/1992	420	40	84	OPEN	GOOD	- -		00536
KNOX			RUDDER RD	/ /	400	90	STEEL	84 - 420		- -	Y	HOME
0147NE	7	93004736	(b) (6) (b) (6)	06/26/1993	240	30	105	OPEN	OTHR	35-52-35	S	00385
KNOX			8402SPANGLER	4/28/1994	211	50	STEEL	105 - 240	008304	83-50-37	Y	HOME
0147NE	7	95005177	(b) (6) (b) (6)	10/20/1995	--	--	39	OPEN	OTHR	- -		00385
KNOX		D0007915	TARWATER ROAD	/ /	58	--	STEEL	39 - 39		- -	Y	HOME
0147NE	8	00901290	(b) (6) (b) (6)	09/12/1983	515	78	83	OPEN	GOOD	35-52-42	F	00385
BLOUNT			PICKENS GAP	04/05/1984	292	220	STEEL	83 - 515		83-48-31	Y	HOME
0147NE	8	00901785	(b) (6) (b) (6)	07/28/1989	425	7	48		GOOD	- -		00031
BLOUNT			DAY FARM RD	/ /	180	--	STEEL	48 - 425		- -	Y	HOME
0147NE	8	09300192	(b) (6)	11/26/1969	147	--	77		GOOD	- -		00450
KNOX			KIMBERLIN HGTS	/ /	140	75	STEEL	-- - --		- -		HOME
0147NE	8	09300520	(b) (6)	07/23/1969	310	--	85		GOOD	35-53-20	S	00209
KNOX				/ /	300	140	STEEL	-- - --		83-48-17		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NE 8	09300521	H V MEMORIAL GARDEN	06/12/1969	182	116	66		GOOD	35-53-38	S	00209
KNOX			/ /	179	80	STEEL	-- - --		83-48-06		COMM
0147NE 8	09300591	(b) (6)	04/09/1970	165	30	130		GOOD	35-53-46	S	00152
KNOX			/ /	150	115	STEEL	-- - --		83-48-26		HOME
0147NE 8	09300594		09/11/1970	225	--	97		GOOD	35-53-12	S	00293
KNOX			/ /	210	60	STEEL	-- - --		83-49-10		HOME
0147NE 8	09300595		08/26/1970	121	--	38		GOOD	35-53-45	S	00293
KNOX			/ /	100	20	STEEL	-- - --		83-49-09		HOME
0147NE 8	09301233		07/14/1978	128	16	42		GOOD	- -		00385
KNOX			/ /	56	--	STEEL	-- - --		- -		HOME
0147NE 8	09301568		06/29/1981	277	15	40		GOOD	35-53-50	S	00589
KNOX			/ /	200	35	STEEL	-- - --		83-49-40		IND
0147NE 8	09301691	(b) (6) __________	08/18/1983	100	25	42	OPEN	GOOD	35-55-00	M	00138
KNOX		MAPLES	/ /	80	35	STEEL	42 - 100		83-40-00	Y	HOME
0147NE 8	09301958	CEDAR_RUN_FARM_	03/06/1987	550	7	54	OPEN	GOOD	- -		00622
KNOX		OLD BROOK HAVEN	/ /	210	18	STEEL	-- - --		- -	Y	HOME
0147NE 8	09301982	(b) (6) __________(b) (6)	04/13/1987	310	15	220	OPEN	OTHR	- -		00115
KNOX		MERRY LANE	/ /	310	140	STEEL	220 - 310		- -	Y	HOME
0147NE 8	09308004	CARTERSWCAVE SPR GS	/ /19	--	620	--		GOOD	35-52-46	S	
KNOX			/ /	--	--		-- - --		83-49-30		HOME
0147NE 8	09309157	(b) (6) 0-14	/ /19	135	--	20		UNK	35-54-00	S	
KNOX			/ /	126	35		-- - --		83-49-14		HOME
0147NE 8	09309170	(b) (6)	00/00/1955	70	20	20		GOOD	35-52-50	S	
KNOX			/ /	50	30	STEEL	-- - --		83-49-50		HOME
0147NE 8	15505347	(b) (6) __________(b) (6)	03/30/1988	350	8	47	OPEN	GOOD	- -		00031
SEVIER		CHATMAN HWY	/ /	161	80	STEEL	47 - 350		- -	Y	HOME
0147NE 8	15505349	(b) (6) __________(b) (6)	01/04/1988	300	10	125	OPEN	GOOD	- -		00031
SEVIER		INDIAN WAR PATH	/ /	280	250	STEEL	125 - 300		- -	Y	HOME
0147NE 8	90000486	(b) (6) __________(b) (6)	01/31/1989	460	12	113	OPEN	OTHR	- -		00385
SEVIER		NEWELL CIRCLE	/ /	216	10	STEEL	113 - 460		- -	Y	HOME
0147NE 8	92002329	(b) (6) __________(b) (6)_	04/20/1992	145	20	21	OPEN	OTHR	- -		00383
BLOUNT		COLD SPRINGS	/ /	80	5	STEEL	21 - 145		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE (0147NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NE 8	93004116	(b) (6) (b) (6)	05/29/1993	530	6	139	OPEN	UNK	- -		00264
KNOX			/ /	380	80	STEEL	139 - 530		- -	Y	HOME
0147NE 8	93005260	BAYS MTN COUNTRY CL	12/01/1993	315	15	62	OPEN	GOOD	- -		00692
SEVIER	D0006536		/ /	295	--	STEEL	62 - 315		- -	Y	IRR
0147NE 8	95002778	LAKEWAY ACADEMY SER	06/02/1995	680	20	42	OPEN	GOOD	- -		00385
BLOUNT	D0007861	PICKENS GAP RD	/ /	105	0	STEEL	42 - 680		- -	Y	COMM
0147NE 8	96004184	(b) (6) (b) (6)	09/09/1996	260	8	20	OPEN	OTHR	- -		00720
SEVIER	D0024003	CHAMBERLAIN WAY	/ /	180	80	STEEL	20 - 260		- -	Y	HOME
0147NE 9	09300531	(b) (6)	09/29/1969	228	--	32		GOOD	35-53-58	S	00293
KNOX			/ /	165	128	STEEL	-- - --		83-47-30		HOME
0147NE 9	09300647		07/13/1976	123	--	27		GOOD	- -		00400
KNOX			/ /	35	35	STEEL	-- - --		- -		HOME
0147NE 9	09301576		03/23/1982	150	7	61		GOOD	35-54-14	S	00580
KNOX			/ /	145	80	STEEL	-- - --		83-46-40		HOME
0147NE 9	09301688	(b) (6) (b) (6)	08/19/1983	140	40	21	OPEN	GOOD	35-54-15	S	00264
KNOX			10/24/1983	120	--	STEEL	21 - 140		83-46-38	Y	HOME
0147NE 9	09309167	(b) (6)	00/00/1950	250	30	30		GOOD	35-54-39	S	
KNOX			/ /	220	60	STEEL	-- - --		83-46-54		HOME
0147NE 9	09309179		/ /19	--	--	--			35-54-14	S	00580
KNOX			/ /	--	--		-- - --		83-46-40		
0147NE 9	15500464		05/12/1966	165	25	86		GOOD	35-52-56	S	00152
SEVIER			/ /	151	68	STEEL	-- - --		83-47-05		HOME
0147NE 9	15500516		06/21/1966	206	5	16		GOOD	35-52-44	S	00152
SEVIER			/ /	180	105	STEEL	-- - --		83-46-26		MUN
0147NE 9	15500827		08/20/1968	185	7	48		GOOD	35-52-53	S	00152
SEVIER			/ /	165	110	STEEL	-- - --		83-46-55		HOME
0147NE 9	15500830		08/01/1968	128	10	23		GOOD	35-52-52	S	00078
SEVIER			/ /	90	60		-- - --		83-46-52		
0147NE 9	15500839		06/08/1968	111	14	22		UNK	35-52-37	S	00078
SEVIER			/ /	102	75	STEEL	-- - --		83-46-02		
0147NE 9	15500867		05/03/1968	160	--	70		GOOD	35-52-56	S	00154
SEVIER			/ /	140	80	STEEL	-- - --		83-46-57		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SHOOKS-GAP QUADRANGLE.(0147NE). TN.

QUAD / COUNTY	NTH	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0147NE SEVIER	9	15500881	(b) (6)	04/06/1968 / /	214 --	-- --	20 STEEL	 -- - --	GOOD	35-52-39 83-46-10	S	00365 HOME
0147NE SEVIER	9	15505685	(b) (6) (b) (6) PINE RIDGE	08/03/1989 / /	310 270	10 200	155 STEEL	OPEN 155 - 310	OTHR	- - - -	Y	00152 HOME
0147NE SEVIER	9	15508239	(b) (6)	09/07/1972 / /	-- --	10 --	--	 -- - --	GOOD	35-53-05 83-46-21	S	
0147NE SEVIER	9	15508240		09/07/1972 / /	-- --	45 --	--	 -- - --	GOOD	35-53-30 83-45-27	S	
0147NE SEVIER	9	90000504	(b) (6) (b) (6) NEWELL CIRCLE R	01/26/1989 / /	460 216	12 6	118 STEEL	OPEN 118 - 460	OTHR	- - - -	Y	00158 HEAT
0147NE SEVIER	9	90001604	(b) (6) (b) (6) BOYDE CREEK RD	05/31/1990 / /	410 90	6 7	62 STEEL	OPEN -- - --	GOOD	- - - -	Y	00031 HOME
0147NE SEVIER	9	91000369	(b) (6) (b) (6)	12/12/1990 / /	105 80	10 20	41 STEEL	OPEN 41 - 105	UNK	- - - -	Y	00264 HOME
0147NE SEVIER	9	91001986	(b) (6) (b) (6) ICKING	05/13/1991 / /	425 250	7 140	42 STEEL	OPEN 42 - 425	OTHR	- - - -	Y	00152 HOME
0147NE KNOX	9	91002287	(b) (6) (b) (6) SHADY	03/09/1991 / /	225 200	30 40	104 STEEL	OPEN 104 - 225	UNK	- - - -	Y	00536 HOME
0147NE KNOX	9	92003426	(b) (6) (b) (6) LOT 14 RAY GAP	09/18/1992 / /	310 210	10 45	42 OTHER	OPEN 42 - 310	OTHR	- - - -	Y	00589 HOME
0147NE SEVIER	9	93004731	(b) (6) (b) (6) 1230 LITTLE BEA	03/02/1992 / /	540 175	15 --	163 STEEL	OPEN 163 - 540	GOOD	- - - -	Y	00385 HOME
0147NE KNOX	9	94005107 D0008233	(b) (6) (b) (6) DODSON OFF SWAP	11/15/1994 / /	205 160	15 80	77 STEEL	OPEN 77 - 205	UNK	- - - -	Y	00536 HOME
0147NE KNOX	9	94005108 D0008231	(b) (6) (b) (6) RHEA	11/21/1994 / /	750 400	2 30	20 STEEL	OPEN 20 - 750	UNK	- - - -	Y	00536 HOME
0147NE KNOX	9	94005117 D0008232	(b) (6) (b) (6) RHEA	11/17/1994 / /	155 110	10 30	20 STEEL	OPEN 20 - 155	UNK	- - - -	Y	00536 HOME

NOV

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS IN SELECTED AREAS OF TENNESSEE

EXPLANATION OF COLUMN HEADINGS

QUAD/NTH = Designation by number, Quadrant and ninth of the 2.5 - minute quadrangle area in which the well is located. The leading numbers identify the 15-minute quadrangle, the next two letters identify the 7.5-minute quadrant and the last digit identifies the one-ninth subdivision of the latter.

COUNTY = County in which the well is located.

WELL NUM = Identification number assigned to the well by the State.

TAG NUM = An inspection number assigned to the well at the time of inspection by the State.

OWNER'S NAME = Name of person or organization for whom the well was drilled.

LOCATION ROAD = Name of street or road from which to access the well. Blank if unknown.

COMP DATE = Month, day and year the well was completed.

INSPT DATE = Month, day and year the well was inspected by TDHE. Blank if well has not been inspected.

TOT DEPTH = Total depth of the well in feet.

AQ DEPTH = Depth, in feet, below land surface to the top of the shallowest aquifer or water-bearing zone tapped by the well.

TOT YIELD = Total yield of the well in gallons per minute (gpm). Yields less than one-half gpm reported as zero.

STAT LEVEL = Static water-level: depth, in feet, from the land surface to the surface of the water standing in an idle well.

CSE DEPTH = Casing depth: depth, in feet, to the bottom of the water tight casing installed in the well.

CSE TYPE = Casing type: PLAST = Plastic; STEEL = Steel; OTHER = any other material such as concrete, fiberglass or tile.

WELL FINISH = Construction of the well in the interval supplying water to the well: OPEN = Uncased or open hole; SLOT = Hand perforated or slotted pipe; SCREEN = Manufactured device designed to maintain the wall of the borehole and allow ground water to enter the well.

INTERVAL = The depth, in feet, from the top to the bottom of the interval that is open to the well.

WAT QUAL = Water Quality: a word to describe the relative quality of the well water such as GOOD, FAIR, BAD, LIME, IRON, SULFUR, SALT, OIL, GAS, OTHER.

GEO FORM = Name of the geologic formation tapped by the well (not generally reported).

LATITUDE = Latitude of well site in degrees, minutes, and seconds.

LONGITUDE = Longitude of well site in degrees, minutes, and seconds.

A/C = Accuracy Code for latitude and longitude: S = Nearest second; F = nearest 15 seconds; T = nearest 30 seconds; M = nearest minute; Blank = nearest 2.5 minutes.

LOG = Refers to availability of drillers log: Y = yes; N = no.

DRILLER = License number of driller who supervised construction of the well. Names provided upon request.

USE = Purpose for which the well was constructed: HOME = residential; COMM = commercial; etc.

" Laboratory Reports "

TDH/DLS. 1997. "Laboratory Reports". Tennessee Department of Health/Division of Laboratory Services. October-November.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

" Inorganic Laboratory Reports "

TDH/DLS. 1997. "Laboratory Reports". Tennessee Department of Health/Division of Laboratory Services. October-November.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

Nashville

Jackson

Knoxville

DEC 0[illegible] 1997

FILE COPY

STATE OF TENNESSEE
ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 BEN ALLEN ROAD
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM-STATE SUPERFUND, KFO**
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

BURL MAUPIN,WM. LEE BARRON
(423)594-6035

Lab ID: **9710216**
Sampling Agency: **HWM_05_KFO**

Billing Code: **327.38-05**

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Edward McGrary

Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calbration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed

Printed: November 24, 1997

DEC 03 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By BHM
County: 47

Lab Number: 9710216-01
Matrix: SEDIMENT
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	121	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	1.08	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	7130	mg/kg	10	11/13/97	JAH	
ANTIMONY	3	mg/kg	1	11/19/97	JAH	
ARSENIC	6	mg/kg	1	11/21/97	JAH	
BARIUM	63	mg/kg	10	11/13/97	JAH	
BERYLLIUM	1	mg/kg	1	11/17/97	JAH	
CADMIUM	0.8	mg/kg	0.5	11/05/97	JAH	
CALCIUM	8000	mg/kg	10	11/07/97	JAH	
CHROMIUM	44	mg/kg	1	11/04/97	JAH	
COBALT	10	mg/kg	1	11/06/97	JAH	
COPPER	809	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	12500	mg/kg	5	11/04/97	JAH	
LEAD	47	mg/kg	4	11/04/97	JAH	
MAGNESIUM	2860	mg/kg	10	11/07/97	JAH	
MANGANESE	511	mg/kg	1	11/04/97	JAH	
MERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	233	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	75.8	%		11/14/97	JAH	
POTASSIUM	869	mg/kg	10	11/06/97	JAH	
SELENIUM	U	mg/kg	1	11/20/97	JAH	

DEC 03 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By BHM
County: 47

Lab Number: 9710216-01
Matrix: SEDIMENT
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	11/06/97	JAH	
SODIUM	7200	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	32	mg/kg	20	11/17/97	JAH	
ZINC	523	mg/kg	0.5	11/05/97	JAH	

DEC 03 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: NW WASTE PILE
Station No.: SMS-WA-01
Collected: 10/21/97 09:40:00 By WLB
County: 47

Lab Number: 9710216-02
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	331	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	96700	mg/kg	10	11/13/97	JAH	
ANTIMONY	13	mg/kg	1	11/19/97	JAH	
ARSENIC	6	mg/kg	1	11/21/97	JAH	
BARIUM	52	mg/kg	10	11/13/97	JAH	
BERYLLIUM	U	mg/kg	1	11/17/97	JAH	
CADMIUM	U	mg/kg	0.5	11/05/97	JAH	
CALCIUM	5630	mg/kg	10	11/07/97	JAH	
CHROMIUM	79	mg/kg	1	11/04/97	JAH	
COBALT	3	mg/kg	1	11/06/97	JAH	
COPPER	42900	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	9920	mg/kg	5	11/04/97	JAH	
LEAD	291	mg/kg	4	11/04/97	JAH	
MAGNESIUM	5410	mg/kg	10	11/07/97	JAH	
MANGANESE	384	mg/kg	1	11/04/97	JAH	
MERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	240	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	67.0	%		11/14/97	JAH	
POTASSIUM	695	mg/kg	10	11/06/97	JAH	
SELENIUM	8	mg/kg	1	11/20/97	JAH	

DEC 03 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: NW WASTE PILE
Station No.: SMS-WA-01
Collected: 10/21/97 09:40:00 By WLB
County: 47

Lab Number: 9710216-02
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	2	mg/kg	1	11/06/97	JAH	
SODIUM	17100	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	38	mg/kg	20	11/17/97	JAH	
ZINC	2330	mg/kg	0.5	11/05/97	JAH	

DEC 03 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: BAGHOUSE DUST
Station No.: SMS-WA-02
Collected: 10/21/97 10:20:00 By WLB
County: 47

Lab Number: 9710216-03
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	1026	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	65500	mg/kg	10	11/13/97	JAH	
ANTIMONY	9	mg/kg	1	11/19/97	JAH	
ARSENIC	6	mg/kg	1	11/21/97	JAH	
BARIUM	30	mg/kg	10	11/13/97	JAH	
BERYLLIUM	U	mg/kg	1	11/17/97	JAH	
CADMIUM	15.6	mg/kg	0.5	11/05/97	JAH	
CALCIUM	11400	mg/kg	10	11/07/97	JAH	
CHROMIUM	6	mg/kg	1	11/04/97	JAH	
COBALT	4	mg/kg	1	11/06/97	JAH	
COPPER	754	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	4860	mg/kg	5	11/04/97	JAH	
LEAD	129	mg/kg	4	11/04/97	JAH	
MAGNESIUM	24600	mg/kg	10	11/07/97	JAH	
MANGANESE	144	mg/kg	1	11/04/97	JAH	
MERCURY	0.73	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	551	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	75.2	%		11/14/97	JAH	
POTASSIUM	4230	mg/kg	10	11/06/97	JAH	
SELENIUM	2	mg/kg	1	11/20/97	JAH	

DEC 03 1997

Project/Site No.:	47-559	Lab Number:	9710216-03
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	WASTE
Description:	BAGHOUSE DUST	Received:	10/21/97 12:45:00 By LAB
Station No.:	SMS-WA-02	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:20:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	1	mg/kg	1	11/06/97	JAH	
SODIUM	107000	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	U	mg/kg	20	11/17/97	JAH	
ZINC	4020	mg/kg	0.5	11/05/97	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: WASTE AREA INSIDE BLDG.
Station No.: WA-03
Collected: 10/21/97 10:30:00 By ADD
County: 47

Lab Number: 9710216-04
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

DEC 03 1997

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	132	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	88800	mg/kg	10	11/13/97	JAH	
ANTIMONY	5	mg/kg	1	11/19/97	JAH	
ARSENIC	7	mg/kg	1	11/21/97	JAH	
BARIUM	111	mg/kg	10	11/13/97	JAH	
BERYLLIUM	2	mg/kg	1	11/17/97	JAH	
CADMIUM	U	mg/kg	0.5	11/05/97	JAH	
CALCIUM	5850	mg/kg	10	11/07/97	JAH	
CHROMIUM	52	mg/kg	1	11/04/97	JAH	
COBALT	6	mg/kg	1	11/06/97	JAH	
COPPER	1080	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	14800	mg/kg	5	11/04/97	JAH	
LEAD	53	mg/kg	4	11/04/97	JAH	
MAGNESIUM	9060	mg/kg	10	11/07/97	JAH	
MANGANESE	388	mg/kg	1	11/04/97	JAH	
MERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	169	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	90.4	%		11/14/97	JAH	
POTASSIUM	15000	mg/kg	10	11/06/97	JAH	
SELENIUM	1	mg/kg	1	11/20/97	JAH	

DEC 0? 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: WASTE AREA INSIDE BLDG.
Station No.: WA-03
Collected: 10/21/97 10:30:00 By ADD
County: 47

Lab Number: 9710216-04
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	11/06/97	JAH	
SODIUM	47400	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	49	mg/kg	20	11/17/97	JAH	
ZINC	1350	mg/kg	0.5	11/05/97	JAH	

DEC 05 1997

Project/Site No.:	47-559	Lab Number:	9710216-05
roject Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL
escription:	OUTSIDE WASTE PILE	Received:	10/21/97 12:45:00 By LAB
Station No.:	WA-04	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 11:05:00 By WLB	Priority:	11_21_97
ounty:	47		

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
MMONIA	135	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
LUMINUM	135000	mg/kg	10	11/13/97	JAH	
NTIMONY	9	mg/kg	1	11/19/97	JAH	
ARSENIC	11	mg/kg	1	11/21/97	JAH	
ARIUM	222	mg/kg	10	11/13/97	JAH	
ERYLLIUM	1	mg/kg	1	11/17/97	JAH	
CADMIUM	1.4	mg/kg	0.5	11/05/97	JAH	
ALCIUM	9680	mg/kg	10	11/07/97	JAH	
HROMIUM	93	mg/kg	1	11/04/97	JAH	
COBALT	13	mg/kg	1	11/06/97	JAH	
OPPER	576	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	15400	mg/kg	5	11/04/97	JAH	
EAD	96	mg/kg	4	11/04/97	JAH	
MAGNESIUM	8240	mg/kg	10	11/07/97	JAH	
ANGANESE	339	mg/kg	1	11/04/97	JAH	
ERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	326	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	78.6	%		11/14/97	JAH	
POTASSIUM	5250	mg/kg	10	11/06/97	JAH	
SELENIUM	2	mg/kg	1	11/20/97	JAH	

DEC 08 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: OUTSIDE WASTE PILE
Station No.: WA-04
Collected: 10/21/97 11:05:00 By WLB
County: 47

Lab Number: 9710216-05
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	11/06/97	JAH	
SODIUM	9880	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	76	mg/kg	20	11/17/97	JAH	
ZINC	1140	mg/kg	0.5	11/05/97	JAH	

" Extractable Organic Laboratory Reports "

TDH/DLS. 1997. "Laboratory Reports". Tennessee Department of Health/Division of Laboratory Services. October-November.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

FILE COPY

DEC 0 8 1997

STATE OF TENNESSEE
ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 BEN ALLEN ROAD
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM-STATE SUPERFUND, KFO**
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

BURL MAUPIN
(615)594-6035

Lab ID: **9710238**
Sampling Agency: **HWM_05_KFO**

Billing Code: **327.38-05**

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calbration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed

Printed: December 1, 1997

DEC 08 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By B M
County: 47

Lab Number: 9710238-01A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
UTYL BENZYL PHTHALATE	U	PPB	200	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	288	PPB	-	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	200	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	500	11/14/97	MAC	
IETHYL PHTHALATE	U	PPB	100	11/14/97	MAC	
IMETHYL PHTHALATE	U	PPB	100	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	500	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	200	11/14/97	MAC	
-NITROSO-di-n-PROPYLAMINE	U	PPB	200	11/14/97	MAC	
SOPHORONE	U	PPB	100	11/14/97	MAC	
ITROBENZENE	U	PPB	200	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	500	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	500	11/14/97	MAC	
CENAPTHENE	U	PPB	100	11/14/97	MAC	
CENAPHTHYLENE	U	PPB	100	11/14/97	MAC	
NTHRACENE	U	PPB	100	11/14/97	MAC	
BENZO(a)ANTHRACENE	136	PPB	-	11/14/97	MAC	
BENZO(a)PYRENE	155	PPB	-	11/14/97	MAC	
BENZO(b)FLUORANTHENE	188	PPB	-	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	200	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	100	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	500	11/14/97	MAC	
FLUORANTHENE	252	PPB	-	11/14/97	MAC	
LUORENE	U	PPB	50	11/14/97	MAC	
NDENO(1,2,3-cd)PYRENE	U	PPB	500	11/14/97	MAC	
NAPHTHALENE	U	PPB	50	11/14/97	MAC	
PHENANTHRENE	137	PPB	-	11/14/97	MAC	
PYRENE	239	PPB	-	11/14/97	MAC	
CHRYSENE	107	PPB	-	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	200	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	200	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	200	11/14/97	MAC	
-BROMOPHENYLPHENYL ETHER	U	PPB	200	11/14/97	MAC	
-CHLOROPHENYLPHENYL ETHER	U	PPB	200	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	500	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	200	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	200	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	200	11/14/97	MAC	
,2,4-TRICHLOROBENZENE	U	PPB	200	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	100	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	200	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	200	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	200	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	200	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	1000	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	500	11/14/97	MAC	
2-NITROPHENOL	U	PPB	500	11/14/97	MAC	
-NITROPHENOL	U	PPB	500	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	500	11/14/97	MAC	
PHENOL	U	PPB	200	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	200	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	200	11/14/97	MAC	
O-CRESOL	U	PPB	200	11/14/97	MAC	
M- & P-CRESOL	U	PPB	200	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	100	11/14/97	MAC	
BENZOIC ACID	U	PPB	1000	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	200	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	200	11/14/97	MAC	
DIBENZOFURAN	U	PPB	50	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	500	11/14/97	MAC	
2-NITROANILINE	U	PPB	500	11/14/97	MAC	
3-NITROANILINE	U	PPB	500	11/14/97	MAC	
4-NITROANILINE	U	PPB	500	11/14/97	MAC	
ALDRIN	U	PPB	2.7	11/14/97	MAC	
alpha-BHC	U	PPB	4.8	11/14/97	MAC	
beta-BHC	U	PPB	7.0	11/14/97	MAC	
delta-BHC	U	PPB	6.9	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	2.7	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	3.7	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	2.7	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	40	11/14/97	MAC	
p,p-DDD	U	PPB	5.0	11/14/97	MAC	
p,p-DDE	U	PPB	4.4	11/14/97	MAC	

DEC 0 0 1997

roject/Site No.:	47-559	Lab Number:	9710238-01A
roject Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
escription:	SW DRAINAGE SEDIMENT	Received:	10/23/97 08:30:00 By LJB
tation No.:	SD-01	Sampling Agency:	HWM_05_KFO
ollected:	10/21/97 09:40:00 By B M	Priority:	11_21_97
ounty:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	4.7	11/14/97	MAC	
DIELDRIN	3.26	PPB	-	11/14/97	MAC	
ENDOSULFAN I	U	PPB	4.4	11/14/97	MAC	
ENDOSULFAN II	U	PPB	5.1	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	5.0	11/14/97	MAC	
ENDRIN	U	PPB	5.0	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	4.2	11/14/97	MAC	
ENDRIN KETONE	U	PPB	5.1	11/14/97	MAC	
HEPTACHLOR	U	PPB	3.3	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.5	11/14/97	MAC	
TOXAPHENE	U	PPB	290	11/14/97	MAC	
METHOXYCHLOR	U	PPB	19	11/14/97	MAC	
PCB 1016/1242	U	PPB	310	11/14/97	MAC	
PCB 1221	U	PPB	340	11/14/97	MAC	
PCB 1232	U	PPB	390	11/14/97	MAC	
PCB 1248	U	PPB	260	11/14/97	MAC	
PCB 1254	U	PPB	170	11/14/97	MAC	
PCB 1260	U	PPB	160	11/14/97	MAC	
PCB 1262	U	PPB	120	11/14/97	MAC	

-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

DEC 08 1997

Project/Site No.:	47-559	Lab Number:	9710238-02A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
Description:	NW WASTE PILE	Received:	10/23/97 08:30:00 By LJB
Station No.:	SMS-WA-01	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 09:40:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	500	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	J 477	PPB	500	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	500	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1300	11/14/97	MAC	
DIETHYL PHTHALATE	B,J 157	PPB	250	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	250	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	1300	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	500	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	500	11/14/97	MAC	
ISOPHORONE	U	PPB	250	11/14/97	MAC	
NITROBENZENE	U	PPB	500	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1300	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1300	11/14/97	MAC	
ACENAPTHENE	U	PPB	250	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	250	11/14/97	MAC	
ANTHRACENE	U	PPB	250	11/14/97	MAC	
BENZO(a)ANTHRACENE	U	PPB	250	11/14/97	MAC	
BENZO(a)PYRENE	U	PPB	250	11/14/97	MAC	
BENZO(b)FLUORANTHENE	U	PPB	250	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	500	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	250	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1300	11/14/97	MAC	
FLUORANTHENE	U	PPB	130	11/14/97	MAC	
FLUORENE	U	PPB	130	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	1300	11/14/97	MAC	
NAPHTHALENE	U	PPB	130	11/14/97	MAC	
PHENANTHRENE	U	PPB	130	11/14/97	MAC	
PYRENE	U	PPB	130	11/14/97	MAC	
CHRYSENE	U	PPB	250	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	500	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	500	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	500	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	500	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	500	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1300	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	500	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	500	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	500	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	500	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	250	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	500	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	500	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	500	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	500	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2500	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1300	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1300	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1300	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1300	11/14/97	MAC	
PHENOL	U	PPB	500	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	500	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	500	11/14/97	MAC	
O-CRESOL	U	PPB	500	11/14/97	MAC	
M- & P-CRESOL	U	PPB	500	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	250	11/14/97	MAC	
BENZOIC ACID	U	PPB	2500	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	500	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	500	11/14/97	MAC	
DIBENZOFURAN	U	PPB	130	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1300	11/14/97	MAC	
2-NITROANILINE	U	PPB	1300	11/14/97	MAC	
3-NITROANILINE	U	PPB	1300	11/14/97	MAC	
4-NITROANILINE	U	PPB	1300	11/14/97	MAC	
ALDRIN	U	PPB	7.0	11/14/97	MAC	
alpha-BHC	U	PPB	13	11/14/97	MAC	
beta-BHC	U	PPB	18	11/14/97	MAC	
delta-BHC	U	PPB	18	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	7.0	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	9.7	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	7.0	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	100	11/14/97	MAC	
p,p-DDD	U	PPB	13	11/14/97	MAC	
p,p-DDE	U	PPB	11	11/14/97	MAC	

DEC 08 1997

Project/Site No.:	47-559	Lab Number:	9710238-02A
roject Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
escription:	NW WASTE PILE	Received:	10/23/97 08:30:00 By LJB
Station No.:	SMS-WA-01	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 09:40:00 By WLB	Priority:	11_21_97
ounty:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	12	11/14/97	MAC	
DIELDRIN	U	PPB	7.3	11/14/97	MAC	
ENDOSULFAN I	U	PPB	12	11/14/97	MAC	
ENDOSULFAN II	U	PPB	13	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	13	11/14/97	MAC	
ENDRIN	U	PPB	13	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	11	11/14/97	MAC	
ENDRIN KETONE	U	PPB	13	11/14/97	MAC	
HEPTACHLOR	U	PPB	8.6	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	9.1	11/14/97	MAC	
TOXAPHENE	U	PPB	770	11/14/97	MAC	
METHOXYCHLOR	U	PPB	51	11/14/97	MAC	
PCB 1016/1242	U	PPB	820	11/14/97	MAC	
PCB 1221	U	PPB	900	11/14/97	MAC	
PCB 1232	U	PPB	1000	11/14/97	MAC	
PCB 1248	U	PPB	690	11/14/97	MAC	
PCB 1254	U	PPB	450	11/14/97	MAC	
PCB 1260	U	PPB	400	11/14/97	MAC	
PCB 1262	U	PPB	320	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG   *Printed: December 1, 1997*

DEC 08 1997

Project/Site No.:	47-559	Lab Number:	9710238-03A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
Description:	BAGHOUSE DUST	Received:	10/23/97 08:30:00 By LJB
Station No.:	SMS-WA-02	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:20:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	470	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	541	PPB	-	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	470	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1200	11/14/97	MAC	
DIETHYL PHTHALATE	U	PPB	230	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	230	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	1200	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	470	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	470	11/14/97	MAC	
ISOPHORONE	U	PPB	230	11/14/97	MAC	
NITROBENZENE	U	PPB	470	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
ACENAPTHENE	U	PPB	230	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	230	11/14/97	MAC	
ANTHRACENE	U	PPB	230	11/14/97	MAC	
BENZO(a)ANTHRACENE	239	PPB	-	11/14/97	MAC	
BENZO(a)PYRENE	609	PPB	-	11/14/97	MAC	
BENZO(b)FLUORANTHENE	1440	PPB	-	11/14/97	MAC	
BENZO(ghi)PERYLENE	2100	PPB	-	11/14/97	MAC	
BENZO(k)FLUORANTHENE	279	PPB	-	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1200	11/14/97	MAC	
FLUORANTHENE	396	PPB	-	11/14/97	MAC	
FLUORENE	U	PPB	120	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	2170	PPB	-	11/14/97	MAC	
NAPHTHALENE	U	PPB	120	11/14/97	MAC	
PHENANTHRENE	143	PPB	-	11/14/97	MAC	
PYRENE	288	PPB	-	11/14/97	MAC	
CHRYSENE	408	PPB	-	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	470	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	470	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	470	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	470	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	470	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1200	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	470	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	470	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	470	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	470	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	230	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	470	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	470	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	470	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	470	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2300	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1200	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1200	11/14/97	MAC	
PHENOL	U	PPB	470	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	470	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	470	11/14/97	MAC	
O-CRESOL	U	PPB	470	11/14/97	MAC	
M- & P-CRESOL	U	PPB	470	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	230	11/14/97	MAC	
BENZOIC ACID	U	PPB	2300	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	470	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	470	11/14/97	MAC	
DIBENZOFURAN	U	PPB	120	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1200	11/14/97	MAC	
2-NITROANILINE	U	PPB	1200	11/14/97	MAC	
3-NITROANILINE	U	PPB	1200	11/14/97	MAC	
4-NITROANILINE	U	PPB	1200	11/14/97	MAC	
ALDRIN	U	PPB	6.4	11/14/97	MAC	
alpha-BHC	U	PPB	11	11/14/97	MAC	
beta-BHC	U	PPB	16	11/14/97	MAC	
delta-BHC	U	PPB	16	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	6.4	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	8.8	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	6.3	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	95	11/14/97	MAC	
p,p-DDD	U	PPB	12	11/14/97	MAC	
p,p-DDE	U	PPB	10	11/14/97	MAC	

DEC 08 1997

Project/Site No.:	47-559	Lab Number:	9710238-03A
roject Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
escription:	BAGHOUSE DUST	Received:	10/23/97 08:30:00 By LJB
Station No.:	SMS-WA-02	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:20:00 By WLB	Priority:	11_21_97
ounty:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	11	11/14/97	MAC	
DIELDRIN	U	PPB	6.6	11/14/97	MAC	
ENDOSULFAN I	U	PPB	10	11/14/97	MAC	
ENDOSULFAN II	U	PPB	12	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	12	11/14/97	MAC	
ENDRIN	U	PPB	12	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	20	11/14/97	MAC	
ENDRIN KETONE	U	PPB	24	11/14/97	MAC	
HEPTACHLOR	U	PPB	7.8	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	8.3	11/14/97	MAC	
TOXAPHENE	U	PPB	700	11/14/97	MAC	
METHOXYCHLOR	U	PPB	46	11/14/97	MAC	
PCB 1016/1242	U	PPB	740	11/14/97	MAC	
PCB 1221	U	PPB	810	11/14/97	MAC	
PCB 1232	U	PPB	920	11/14/97	MAC	
PCB 1248	U	PPB	620	11/14/97	MAC	
PCB 1254	U	PPB	410	11/14/97	MAC	
PCB 1260	U	PPB	370	11/14/97	MAC	
PCB 1262	U	PPB	300	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

DEC 08 1997

Project/Site No.:	47-559	Lab Number:	9710238-04A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
Description:	WASTE AREA INSIDE BLDS.	Received:	10/23/97 08:30:00 By LJB
Station No.:	WA-03	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:30:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	410	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	572	PPB	-	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	410	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1000	11/14/97	MAC	
DIETHYL PHTHALATE	U	PPB	200	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	200	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	100	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	410	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	410	11/14/97	MAC	
ISOPHORONE	U	PPB	100	11/14/97	MAC	
NITROBENZENE	U	PPB	410	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1000	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1000	11/14/97	MAC	
ACENAPTHENE	U	PPB	200	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	200	11/14/97	MAC	
ANTHRACENE	U	PPB	200	11/14/97	MAC	
BENZO(a)ANTHRACENE	U	PPB	200	11/14/97	MAC	
BENZO(a)PYRENE	U	PPB	200	11/14/97	MAC	
BENZO(b)FLUORANTHENE	U	PPB	200	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	410	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	200	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1000	11/14/97	MAC	
FLUORANTHENE	U	PPB	100	11/14/97	MAC	
FLUORENE	U	PPB	100	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	1000	11/14/97	MAC	
NAPHTHALENE	U	PPB	100	11/14/97	MAC	
PHENANTHRENE	J 79.9	PPB	100	11/14/97	MAC	
PYRENE	U	PPB	100	11/14/97	MAC	
CHRYSENE	U	PPB	200	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	410	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	410	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	410	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	410	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	410	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1000	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	410	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	410	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	410	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	410	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	200	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	410	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	410	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	410	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	410	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2000	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1000	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1000	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1000	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1000	11/14/97	MAC	
PHENOL	U	PPB	410	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	410	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	410	11/14/97	MAC	
O-CRESOL	U	PPB	410	11/14/97	MAC	
M- & P-CRESOL	U	PPB	410	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	200	11/14/97	MAC	
BENZOIC ACID	U	PPB	2000	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	410	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	410	11/14/97	MAC	
DIBENZOFURAN	U	PPB	100	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1000	11/14/97	MAC	
2-NITROANILINE	U	PPB	1000	11/14/97	MAC	
3-NITROANILINE	U	PPB	1000	11/14/97	MAC	
4-NITROANILINE	U	PPB	1000	11/14/97	MAC	
ALDRIN	U	PPB	10	11/14/97	MAC	
alpha-BHC	U	PPB	19	11/14/97	MAC	
beta-BHC	U	PPB	27	11/14/97	MAC	
delta-BHC	U	PPB	27	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	10	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	14	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	10	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	78	11/14/97	MAC	
p,p-DDD	U	PPB	9.7	11/14/97	MAC	
p,p-DDE	U	PPB	17	11/14/97	MAC	

DEC 0 8 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: WASTE AREA INSIDE BLDS.
Station No.: WA-03
Collected: 10/21/97 10:30:00 By WLB
County: 47

Lab Number: 9710238-04A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
3/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	9.1	11/14/97	MAC	
DIELDRIN	U	PPB	11	11/14/97	MAC	
ENDOSULFAN I	U	PPB	17	11/14/97	MAC	
ENDOSULFAN II	U	PPB	9.8	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	9.8	11/14/97	MAC	
ENDRIN	U	PPB	9.8	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	8.2	11/14/97	MAC	
ENDRIN KETONE	U	PPB	10	11/14/97	MAC	
HEPTACHLOR	U	PPB	13	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	14	11/14/97	MAC	
TOXAPHENE	U	PPB	570	11/14/97	MAC	
METHOXYCHLOR	U	PPB	38	11/14/97	MAC	
PCB 1016/1242	U	PPB	610	11/14/97	MAC	
PCB 1221	U	PPB	670	11/14/97	MAC	
PCB 1232	U	PPB	760	11/14/97	MAC	
PCB 1248	U	PPB	520	11/14/97	MAC	
PCB 1254	U	PPB	340	11/14/97	MAC	
PCB 1260	U	PPB	300	11/14/97	MAC	
PCB 1262	U	PPB	240	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

DEC 0 8 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: OUTSIDE WASTE PILE
Station No.: WA-04
Collected: 10/21/97 11:05:00 By WLB
County: 47

Lab Number: 9710238-05A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	460	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	U	PPB	460	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	460	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1200	11/14/97	MAC	
DIETHYL PHTHALATE	B,J 125	PPB	230	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	230	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	1200	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	460	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	460	11/14/97	MAC	
ISOPHORONE	U	PPB	230	11/14/97	MAC	
NITROBENZENE	U	PPB	460	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
ACENAPTHENE	U	PPB	230	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	230	11/14/97	MAC	
ANTHRACENE	U	PPB	230	11/14/97	MAC	
BENZO(a)ANTHRACENE	U	PPB	230	11/14/97	MAC	
BENZO(a)PYRENE	U	PPB	230	11/14/97	MAC	
BENZO(b)FLUORANTHENE	U	PPB	230	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	460	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	230	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1200	11/14/97	MAC	
FLUORANTHENE	U	PPB	120	11/14/97	MAC	
FLUORENE	U	PPB	120	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	1200	11/14/97	MAC	
NAPHTHALENE	U	PPB	120	11/14/97	MAC	
PHENANTHRENE	U	PPB	120	11/14/97	MAC	
PYRENE	U	PPB	120	11/14/97	MAC	
CHRYSENE	U	PPB	230	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	460	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	460	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	460	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	460	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	460	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1200	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	460	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	460	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	460	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	460	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	230	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	460	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	460	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	460	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	460	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2300	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1200	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1200	11/14/97	MAC	
PHENOL	U	PPB	460	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	460	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	460	11/14/97	MAC	
O-CRESOL	U	PPB	460	11/14/97	MAC	
M- & P-CRESOL	U	PPB	460	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	230	11/14/97	MAC	
BENZOIC ACID	U	PPB	2300	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	460	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	460	11/14/97	MAC	
DIBENZOFURAN	U	PPB	120	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1200	11/14/97	MAC	
2-NITROANILINE	U	PPB	1200	11/14/97	MAC	
3-NITROANILINE	U	PPB	1200	11/14/97	MAC	
4-NITROANILINE	U	PPB	1200	11/14/97	MAC	
ALDRIN	U	PPB	6.2	11/14/97	MAC	
alpha-BHC	U	PPB	11	11/14/97	MAC	
beta-BHC	U	PPB	16	11/14/97	MAC	
delta-BHC	U	PPB	16	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	6.2	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	8.6	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	6.2	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	93	11/14/97	MAC	
p,p-DDD	U	PPB	12	11/14/97	MAC	
p,p-DDE	U	PPB	10	11/14/97	MAC	

Project/Site No.:	47-559	Lab Number:	9710238-05A	DEC 08 1997
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT	
escription:	OUTSIDE WASTE PILE	Received:	10/23/97 08:30:00 By LJB	
tation No.:	WA-04	Sampling Agency:	HWM_05_KFO	
Collected:	10/21/97 11:05:00 By WLB	Priority:	11_21_97	
County:	47			

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	11	11/14/97	MAC	
DIELDRIN	U	PPB	6.5	11/14/97	MAC	
ENDOSULFAN I	U	PPB	10	11/14/97	MAC	
ENDOSULFAN II	U	PPB	12	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	12	11/14/97	MAC	
ENDRIN	U	PPB	12	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	9.8	11/14/97	MAC	
ENDRIN KETONE	U	PPB	12	11/14/97	MAC	
HEPTACHLOR	U	PPB	7.7	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	8.1	11/14/97	MAC	
TOXAPHENE	U	PPB	680	11/14/97	MAC	
METHOXYCHLOR	U	PPB	45	11/14/97	MAC	
PCB 1016/1242	U	PPB	730	11/14/97	MAC	
PCB 1221	U	PPB	800	11/14/97	MAC	
PCB 1232	U	PPB	900	11/14/97	MAC	
PCB 1248	U	PPB	610	11/14/97	MAC	
PCB 1254	U	PPB	400	11/14/97	MAC	
PCB 1260	U	PPB	360	11/14/97	MAC	
PCB 1262	U	PPB	290	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

" Volatile Organic Laboratory Reports "

TDH/DLS. 1997. "Laboratory Reports". Tennessee Department of Health/Division of Laboratory Services. October-November.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

OCT 30 1997

FILE COPY

STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 BEN ALLEN ROAD
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM-STATE SUPERFUND, KFO**
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

BURL MAUPIN,WM. LEE BARRON
(423)594-6035

Lab ID: 9710216
Sampling Agency: HWM_05_KFO

Billing Code: 327.38-05

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calbration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed

Printed: October 27, 1997

OCT 30 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Site Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By BHM
County: 47

Lab Number: 9710216-01E
Matrix: SEDIMENT
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	J 0.6	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

OCT 30 1997

Project/Site No.:	47-559	Lab Number:	9710216-02E
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	WASTE
Site Description:	NW WASTE PILE	Received:	10/21/97 12:45:00 By LAB
Station No.:	SMS-WA-01	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 09:40:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	J 1.4	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

OCT 30 1997

Project/Site No.:	47-559	Lab Number:	9710216-03E
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	WASTE
Site Description:	BAGHOUSE DUST	Received:	10/21/97 12:45:00 By LAB
Station No.:	SMS-WA-02	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:20:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	J 0.8	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	3.6	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

OCT 30 1997

Project/Site No.:	47-559	Lab Number:	9710216-04E
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL
Site Description:	WASTE AREA INSIDE BLDG.	Received:	10/21/97 12:45:00 By LAB
Station No.:	WA-03	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:30:00 By ADD	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	2.3	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG   *Printed: October 27, 1997*

OCT 30 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Site Description: OUTSIDE WASTE PILE
Station No.: WA-04
Collected: 10/21/97 11:05:00 By WLB
County: 47

Lab Number: 9710216-05E
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	4.7	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

" Radiological Laboratory Reports "

TDH/DLS. 1997. "Laboratory Reports". Tennessee Department of Health/Division of Laboratory Services. October-November.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

NOV 21 1997

FILE COPY

Nashville

Jackson

Knoxville

STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 BEN ALLEN ROAD
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: HWM-STATE SUPERFUND, KFO
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

BURL MAUPIN,WM. LEE BARRON
(423)594-6035

Lab ID: 9710216
Sampling Agency: HWM_05_KFO

Billing Code: 327.38-05

THE GREAT SEAL OF THE STATE OF TENNESSEE
XVI
AGRICULTURE
COMMERCE
1796

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Bob Read

Analytical Supervisor

Printed: October 30, 1997

NOV 21 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By BHM
County: 47

Lab Number: 9710216-01F
Matrix: SEDIMENT
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	8.05	0.56	pCi/g dry wt	10/28/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.42	0.67	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	12.4	1.4	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-02F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	WASTE
Description:	NW WASTE PILE	Received:	10/21/97 12:45:00 By LAB
Station No.:	SMS-WA-01	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 09:40:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
Pb-214	0.219	0.040	pCi/g dry wt	10/28/97	RJR	
Bi-214	0.242	0.050	pCi/g dry wt	10/28/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.79	0.55	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	2.72	0.89	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-03F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	WASTE
Description:	BAGHOUSE DUST	Received:	10/21/97 12:45:00 By LAB
Station No.:	SMS-WA-02	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:20:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	4.46	0.53	pCi/g dry wt	10/29/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.36	0.39	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	7.4	1.1	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-04F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL
Description:	WASTE AREA INSIDE BLDG.	Received:	10/21/97 12:45:00 By LAB
Station No.:	WA-03	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:30:00 By ADD	Priority:	11_21_97
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	11.93	0.59	pCi/g dry wt	10/29/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.65	0.73	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	21.7	1.7	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-05F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL
Description:	OUTSIDE WASTE PILE	Received:	10/21/97 12:45:00 By LAB
Station No.:	WA-04	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 11:05:00 By ADD	Priority:	11_21_97
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	5.52	0.39	pCi/g dry wt	10/29/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.78	0.55	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	11.3	1.4	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

Project/Site No.:	47-559	Lab Number:	9710216-06A	NOV 21 1997
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL	
Description:	OUTSIDE WASTE PILE DUP.	Received:	10/21/97 12:45:00 By LAB	
Station No.:	WA-04	Sampling Agency:	HWM_05_KFO	
Collected:	10/21/97 11:05:00 By ADD	Priority:	11_21_97	
County:	47			

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.08	0.61	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	11.5	1.3	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

State of . .nnessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Radiochemical Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SD-01	COUNTY Knox
DESCRIPTION SW drainage sediment	
STREAM MILE	DEPTH
COLLECTED: DATE 10-21-97	TIME 9:40a
PICK-UP DATE:	
CONTACT HAZARD ammonia, metals	mR/hr Reading <0.1
SAMPLER'S NAME (printed) Bud Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273805
IF PRIORITY, DATE NEEDED 11-21-97	
SEND REPORT TO: KFO	

Laboratory Number 9710216-01F

Branch Lab Number

Date Received 10-23-97

Time Received 0900 By RJR

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation X Sediment

Other____________

Field Comments:

Air Samples

Volume ________

Total Hours ________

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 10-21-97 Time 9:40a
   Delivered to KBL
   Date 10-21-97 Time 12:45 p.m.
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by [signature]
   Date 10-21-97 Time 13:50

Additional Information

1. Approximate volume of sample 500ml
2. Nearest town or city Knoxville
3. Others present at collection WLB, JWW, ADD
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample standard
6. Mode of transportation to lab state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

GREYHOUND OCT 2 2 1997 15:30

NOV 2 1 1997

PH-3009 (rev 1/96) RDA 1527

State of Tennessee - Environmental Laboratories
PLEASE PRINT LEGIBLY

Radiochemical Analysis

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKEY MTN. SMELTERS
STATION NUMBER	SMS-WA-01	COUNTY	KNOX
DESCRIPTION	NW WASTE PILE		
STREAM MILE	N/A	DEPTH	0" to 10"
COLLECTED: DATE	10-21-97	TIME	09:40
PICK-UP DATE:	N/A		
CONTACT HAZARD	UNKNOWN	mR/hr Reading	<0.1 mR/hr
SAMPLER'S NAME (printed)	Wm. LEE BARRON		
SAMPLING AGENCY	TDSF	BILLING CODE	327.38.05
IF PRIORITY, DATE NEEDED	11-28-97		
SEND REPORT TO:	BURL MAUPIN, TDSF, KNOXVILLE ENVIRONMENTAL FIELD OFFICE		

Laboratory Number 971021 6-02F
Branch Lab Number
Date Received 10-23-97
Time Received 0900 By RJR

Sample Type
___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil X Solid
___Vegetation ___Sediment
Other WASTE

Field Comments:

Air Samples
Volume ________
Total Hours ________

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & J.W.W.
   Date 10-21-97 Time 09:40
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45 p.m.
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible signature]
   Date 10-21-97 Time 12:45
   Logged in by [illegible signature]
   Date 10-21-97 Time 13:50

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection G.H.M. & A.D.D.
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

GREYHOUND OCT 22 1997, 15:30

NOV 21 1997

PH-3009 (rev 1/96) RDA 1527

State of Tennessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-02	COUNTY KNOX
DESCRIPTION BAGHOUSE DUST	
STREAM MILE N/A	DEPTH 0" to 10"
COLLECTED: DATE 10-21-97	TIME 10:20
PICK-UP DATE: N/A	
CONTACT HAZARD UNKNOWN	mR/hr Reading <0.1 mR/hr
SAMPLER'S NAME (printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.05
IF PRIORITY, DATE NEEDED 11-28-97	
SEND REPORT TO: BURL MAUPIN, TDSF, KNOXVILLE ENVIRONMENTAL FIELD OFFICE	

Laboratory Number 9710216-03 F

Branch Lab Number

Date Received 10-23-97

Time Received 0900 By RJR

Sample Type

___ Air ___ Milk ___ Swipe
___ Water ___ Tissue ___ Liquid
___ Sludge ___ Soil X Solid
___ Vegetation ___ Sediment

Other WASTE

Field Comments:

Air Samples
Volume ______
Total Hours ______

___ Sample Filtration
___ Sample Acidification
___ Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & J.W.W.
   Date 10-21-97 Time 10:20
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45p
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by [signature]
   Date 10-21-97 Time 13:50

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection RHM & A.D.D.
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

GREYHOUND OCT 22 1997 15:30

NOV 21 1997

PH-3009 (rev 1/96)

RDA 1527

State of Tennessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn Smelters
STATION NUMBER WA-03	COUNTY Knox
DESCRIPTION waste area inside Bldg	
STREAM MILE	DEPTH
COLLECTED: DATE 10-21-97	TIME 10:30
PICK-UP DATE:	
CONTACT HAZARD Ammonia metal	mR/hr Reading =.02
SAMPLER'S NAME (printed) Adam Deweese	
SAMPLING AGENCY DSF	BILLING CODE 327.28.01
IF PRIORITY, DATE NEEDED 11-21-97	
SEND REPORT TO: KFO	

Laboratory Number 9710216-04F

Branch Lab Number

Date Received 10-23-97

Time Received 0900 By RJR

Sample Type

___Air ___Water ___Sludge ___Vegetation ___Milk ___Tissue X Soil ___Sediment ___Swipe ___Liquid ___Solid

Other___

Field Comments:

Air Samples

Volume ___

Total Hours ___

___Sample Filtration

___Sample Acidification

___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by ADD
   Date 10-21-97 Time 10:30
   Delivered to KRL
   Date 10-21-97 Time 12:45
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by Janet A. Baker
   Date 10-21-97 Time 12:45
   Logged in by Janet A. Baker
   Date 10-21-97 Time 13:30

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 500ml
2. Nearest town or city Knoxville
3. Others present at collection WLP, RHM, JWW
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample Standard
6. Mode of transportation to lab State Vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

GREYHOUND OCT 22 1997 15:30

NOV 21 1997

PH-3009 (rev 1/96)

RDA 1527

State of Tennessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn Smelters
STATION NUMBER WA04	COUNTY Knox
DESCRIPTION Outside Waste Pile	
STREAM MILE	DEPTH
COLLECTED: DATE 10/21/97	TIME 11:05
PICK-UP DATE:	
CONTACT HAZARD NH3 & Metals	mR/hr Reading < 0.1
SAMPLER'S NAME (printed) Bee Barron	
SAMPLING AGENCY DSF	BILLING CODE 327.38.01
IF PRIORITY, DATE NEEDED 11/21/97	
SEND REPORT TO: KFO - BHM	

Laboratory Number 9710216-05 F/06

Branch Lab Number

Date Received 10-23-97

Time Received 0900 By RJR

Sample Type

___ Air ___ Milk ___ Swipe
___ Water ___ Tissue ___ Liquid
___ Sludge ___ Soil X Solid
___ Vegetation ___ Sediment

Other ______

Field Comments:

Air Samples

Volume ______

Total Hours ______

___ Sample Filtration
___ Sample Acidification
___ Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by WLB
   Date 10/21/97 Time 11:05a
   Delivered to KBL
   Date 10/21/97 Time 12:45p
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by Samuel A. Baker
   Date 10-23-97 Time 12:45
   Logged in by Samuel A. Baker
   Date 10-21-97 Time 13:38

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 500 ml
2. Nearest town or city Knoxville
3. Others present at collection JWW, ROD, BHM
4. Number of other samples collected at same time at this point # 3
5. Field collection procedure, handling and/or preservation of this sample standard
6. Mode of transportation to lab state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

GREYHOUND OCT 22 1997 15:30

NOV 21 1997

PH-3009 (rev 1/96)

RDA 1527

" Special Solid Waste Notice of Approval "

TDHE/Division of Soild Waste Management (DSWM). 1990. Tennessee Department of Health and Environment, Special Solid Waste Notice of Approval (Letter #2468/2640), issued to Smokey Mountain Smelters, Inc. October 12.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

file?
Special waste
Knox Co. 199_

File Copy

STATE OF TENNESSEE
[DEPART]MENT OF HEALTH AND ENVIRONMENT
2700 Middlebrook Pike
Suite 220
Knoxville, Tennessee 37921

October 12, 1990

NOTICE OF APPROVAL
SPECIAL SOLID WASTE
SNL 47-103-0177 or
01-103-0160
Letter # 2468/2640

Mr. Daniel E. Johnson, President
Smokey Mountain Smelters, Inc.
P. O. Box 2704
Knoxville, Tennessee 37901

RE: Disposal of Waste Salt Cake from Aluminum Dross Re-Smelting

Dear Mr. Johnson:

The Division of Solid Waste Management has reviewed the special solid waste information you submitted to our office in accordance with the Regulations Governing Solid Waste Processing and Disposal in Tennessee.

After reviewing the physical and chemical properties from the special waste information, the Department has determined the waste suitable for disposal in the BFI Twin Oaks or Waste Management Chestnut Ridge Sanitary Landfill. However, should the chemical or physical properties of the waste change significantly (i.e., quantity, moisture content, pH, etc.), the waste must be reevaluated by the Department. The estimated quantity of waste is 3-4 30 cubic yard truckloads per week.

In order for this waste to be properly and safely disposed of in a sanitary landfill, the following procedures must be followed:

1. Since we have received no response from you since January of this year concerning selling this material as a marketable commodity or permitting your own landfill, we must assume that this material has been and is being disposed of on your property without a permit. We are therefore instructing you to begin removing the waste and hauling it to one of the landfills as soon as arrangements can be completed.

2. Any newly generated salt cake waste must be allowed to cool thoroughly before delivering it to the landfill.

3. Newly generated salt cake waste must be protected from rain and kept dry until it is delivered to the landfill. All trucks hauling salt cake waste to the landfill must be covered.

4. Deliveries of this waste must not be made when it is raining or if the ground is wet.

5. The waste must be covered with soil as soon as possible after it is delivered to the landfill. It must be placed in a separate cell from municipal garbage although it may be co-disposed with fly ash or other similar dry special wastes. Cover must be applied before rain begins or before the end of the working day, whichever comes first.

6. An exception may be made for old wastes for which the reaction with moisture is essentially complete. Waste may be removed from the back of the pile, where it is estimated to be about ten years old, and managed by co-disposing it with any solid waste that is not wet (although preferably with drier wastes such as construction debris) so long as weather conditions are favorable and the waste is completely covered with soil by the end of the day.

   Representative samples should be taken of the waste from the back of the pile toward the front and reacted with water under controlled conditions in a laboratory, to determine which wastes will react with water to form ammonia and whichones will not. Based on this testing a site drawing should be submitted to the Division defining what areas of the pile should be treated as old, non-reactive wastes and which should be treated as new (reactive) waste. Without such data only those wastes along the back of the pile, which were placed first, may be treated as "old" wastes.

   If at any time an ammonia odor is detected when a truckload of this waste is uncovered, it must be managed in accordance with condition #5.

Mr. Daniel E. Johnson, President
Smokey Mountain Smelters, Inc.
Page 2
October 12, 1990

If you have any questions or require additional assistance, please contact this office.

Sincerely,

Rick Brown

Rick Brown
Environmental Engineer

RSB:29169258 SW17

cc: Division of Solid Waste Management-Central Office
BFI Twin Oaks Registered Sanitary Landfill
Waste Management Chestnut Ridge Registered Sanitary Landfill

"Tennessee Valley Reservoir and Stream Quality"

TVA. 1993. "Tennessee Valley Reservoir and Stream Quality - 1993". Tennessee Valley Authority, Division of Water Management, May 1994.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

JEB ✓ 8-22

Tennessee Valley Authority

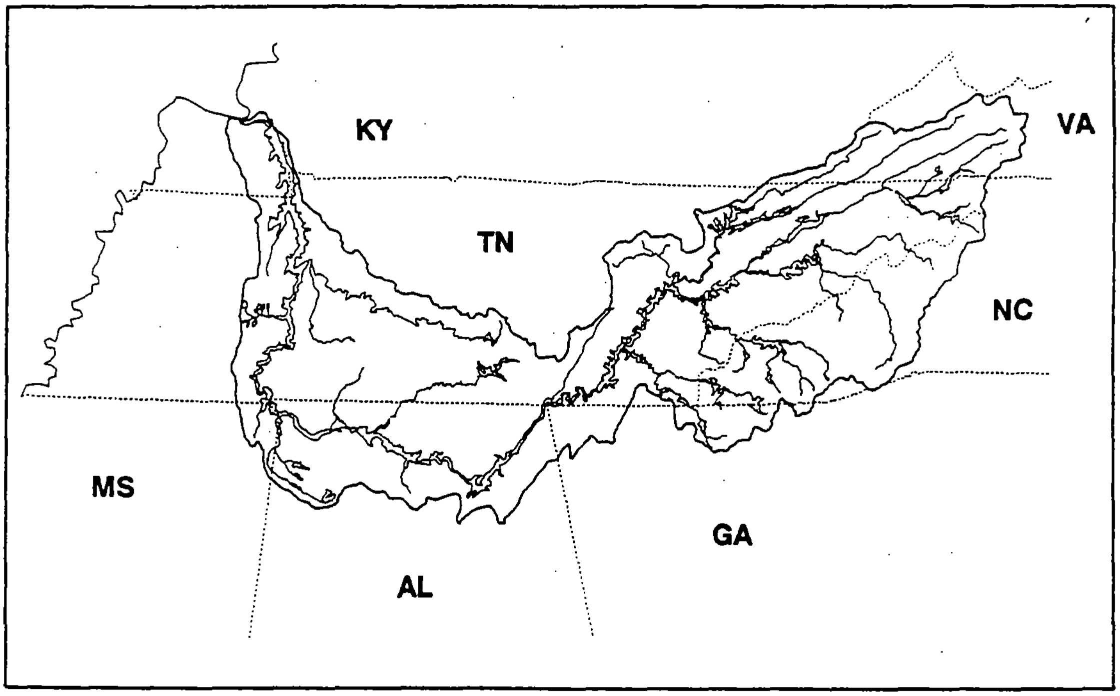
Water Management
Chattanooga, Tennessee

May 1994

TENNESSEE VALLEY RESERVOIR AND STREAM QUALITY - 1993

SUMMARY OF VITAL SIGNS AND USE SUITABILITY MONITORING

VOLUME I



CLEAN WATER INITIATIVE

13.2 Fort Loudoun Reservoir

Physical Description

Fort Loudoun Reservoir is the ninth and uppermost reservoir on the Tennessee River with the dam located at TRM 602.3. The surface area and shoreline are relatively small (14,600 acres and 360 miles, respectively) considering the length (61 miles), indicating it is mostly a run-of-the-river reservoir. The average annual discharge from Fort Loudoun Dam is 18,400 cfs which provides an average hydraulic retention time of about ten days.

Fort Loudoun Reservoir (and the Tennessee River) is formed by the confluence of the French Broad and Holston Rivers, with both of these rivers having a major reservoir upstream. Douglas Dam, 32.3 miles up the French Broad River, and Cherokee Dam, 52.3 miles up the Holston River, form deep storage impoundments, each having long retention times. Both of these deep storage impoundments become strongly stratified during summer months resulting in the release of cool, low DO, hypolimnetic water during operation of the hydroelectric units. Some warming and reaeration of the water occurs downstream from Cherokee and Douglas Dams, but both temperature and DO levels are sometimes low when the water reaches Fort Loudoun Reservoir.

Fort Loudoun Reservoir also receives surface waters from the Little Tennessee River, via the Tellico Reservoir canal, which connects the forebays of the two reservoirs. (Since Tellico Dam has no outlet, under most normal conditions, water flows into Fort Loudoun Reservoir from Tellico Reservoir.) Water from Tellico Reservoir (Little Tennessee River) is often cooler and higher in DO, and has a much lower conductivity than water in Fort Loudoun Reservoir (Tennessee River). In 1992, the forebay sampling location on Fort Loudoun Reservoir (originally located at TRM 603.2) was moved upstream to TRM 605.5. This resulted in a better assessment of the water quality conditions of the Tennessee River in the forebay portion of Fort Loudoun Reservoir by minimizing the effects of the Little Tennessee River and Tellico Reservoir on the data gathered in the forebay of Fort Loudoun Reservoir.

Although Fort Loudoun Reservoir is a mainstream reservoir, its complex set of hydrologic conditions (cool water inflows from the Holston, French Broad, and Little Tennessee Rivers) often causes it to exhibit several characteristics that are more typical of a storage impoundment. In fact, analysis of historical fisheries data for the Tennessee Valley indicates the fish community of Fort Loudoun Reservoir is more similar to that in Valley storage impoundments than in other mainstream reservoirs.

Ecological Health

Vital Signs monitoring information showed the ecological health of Fort Loudoun Reservoir was between fair and poor in 1993 (58 percent), basically similar to 1992 (53 percent) and 1991 (60 percent). The only ecological health indicator which rated good or excellent on Fort Loudoun was DO at the forebay and transitions zone (no data were available from the inflow). Such good ratings for DO were surprising based on observations of lower DOs in 1993 in other mainstream reservoirs and historical concerns about DO in Fort Loudoun Reservoir.

Several indicators rated poor or very poor. Sediment quality at the forebay rated poor due to high zinc concentrations, presence of chlordane, and toxicity to Ceriodaphnia. Transition zone sediments rated fair with similar conditions as the forebay, but no toxicity to test organisms was found. These findings are consistent with results found in previous years. The fish assemblage rated poor at all three sample sites (forebay, transition zone, and inflow) mostly due to low species richness and low capture rate of individuals (similar to previous years). Benthic macroinvertebrates rated very poor at the inflow site due to low species richness and abundance (comparable to previous years). Benthos rated fair at the forebay and transition zone. Similar results had been found at the transition zone in previous years, but benthic invertebrates at the forebay improved in several metrics, especially species richness and reduced dominance by tolerant organisms.

Aquatic macrophytes only covered 25 acres on Fort Loudoun Reservoir in 1993. Coverage over the past decade has ranged 25 to 140 acres.

Reservoir Use Suitability

TDEC has issued advisories on consumption of two fish species from Fort Loudoun Reservoir. Tennessee advises people not to eat catfish taken from Fort Loudoun Reservoir because of high levels of PCBs. Also, largemouth bass should not be eaten if they weigh over two pounds or are caught in the Little River embayment due to PCB contamination.

Fort Loudoun Reservoir has had a PCB problem for more than 20 years. Initially, TVA and state agencies examined a variety of species from throughout the reservoir to document the geographical and species variation. The study now continues as a trend study in which there is an annual collection of catfish from one location. PCB concentrations in catfish have varied over the years with no distinct trend.

Fecal coliform concentrations at one boat ramp tested in 1993 were within criteria for recreation. In 1989, 1990, and 1992, fecal coliform samples were collected at a total of three

" Graphical Exposure Modeling System (GEMS) Database "

U. S. EPA. 1990. Graphical Exposure Modeling System (GEMS) Database. U.S. Environmental Protection Agency. Compiled from U.S. Bureau of the Census Data (1990).

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

Smokey Mountain Smelters, 47-559
1990 Census Data - Block Level
LAT: 0355511 LONG: 0835548

KM	0.00- 0.4	0.4- 0.8	0.8- 1.6	1.6- 3.2	3.2- 4.8	4.8- 6.4	TOTAL
RING TOTALS	207	831	2995	5515	25906	28954	64408

"Soil Survey - Knox County Tennessee"

U.S.D.A./S.C.S. 1955. Soil Survey / Knox County Tennessee, (with map). U.S. Department of Agriculture/Soil Conservation Service. August. pages: 4-9, 12-27, 102-5, 116-19, 136-7, 198-203, 220-23, 226-7, 230-1, 234-5, 238-9, and Soil Map - Knoxville Quadrangle (Figure 6 - Soil Map).

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

KNOX COUNTY, in the Valley of East Tennessee, is on predominantly rolling and hilly relief but has some steep and rugged areas. Corn and hay are the most important crops. General farming, based on dairying and supplemented by a cash crop of tobacco, is common in the more productive sections. Truck farming is also prevalent. Knoxville, centrally located in the county, is an important industrial and trading center and provides part-time employment for many rural inhabitants and also markets for farm produce. To provide a basis for the best agricultural uses for the land, this cooperative soil survey was made by the United States Department of Agriculture, the Tennessee Agricultural Experiment Station, and the Tennessee Valley Authority. Field work for this survey was completed in 1942. Unless otherwise specifically mentioned, statements in this report refer to conditions in the county at the time field work was completed.

GENERAL NATURE OF THE AREA

LOCATION AND EXTENT

Knox County is in the central part of East Tennessee (fig. 1). The total area of the county is approximately 329,600 acres, or 515 square miles.

ORGANIZATION AND POPULATION

Knox County was organized in 1792. Blount County was established from a part of Knox County in 1795; a small part of Grainger County was added to Knox in 1927, and a small part of Sevier County in 1933. At the time Knox County was established, the few white inhabitants lived chiefly in forts along Beaver Creek. Most of the early white settlers were from Virginia, North Carolina, and the northeastern part of Tennessee. Many soldiers of the Revolutionary War took up claims in payment for their services. The first home in the area now occupied by Knoxville was built in 1786 (*6*).[1]

In 1950 there were 148,166 urban and 74,841 rural people in Knox County. Knoxville is the only incorporated urban area. With its adjoining communities, it includes practically all the urban population of the county. Mascot is the largest village not included in this urban area. Most of the present inhabitants of the county are of English, Scotch, and Irish descent.

Rural population is fairly well distributed over the county. The most sparsely populated rural sections are House Mountain, McAnnally Ridge, Chestnut Ridge, and Copper Ridge. The most densely populated are near Knoxville. More than half of the rural inhabitants do not depend entirely upon farming for a living. Many are employed in Knoxville and nearby industrial plants; some are employed in lumbering and marble quarrying, and a few by the county on public works.

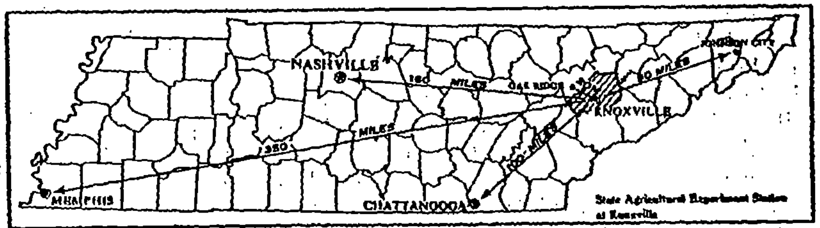


FIGURE 1.—Location of Knox County in Tennessee.

PHYSIOGRAPHY,[2] RELIEF, AND DRAINAGE

Knox County lies wholly within the Ridge and Valley, or Great Valley, physiographic province (*5*) of the southeastern United States. Locally this southern extremity of the province is known as the Valley of East Tennessee. The rock exposures are of the Cambrian, Ordovician, and Silurian geologic systems and are chiefly dolomitic limestones, limestones, and shales. The rock formations have been severely folded and faulted. Differential weathering and subsequent geologic erosion have caused ridges to form on the more resistant rocks, and valleys on the less resistant ones. As a consequence the dominant ridges and valleys follow the strike of the rock formations exposed. The result is a system of parallel ridges and valleys, the axes of which extend in a northeast-southwest direction. Most of the more rugged ridges are on interbedded sandstone and shale and calcareous sandstone; the more extensive valleys are on soft shale and argillaceous limestone. Much of the landscape over cherty dolomitic limestone is very nearly as high as the rugged shale ridges but the areas are broader and less sharply broken.

[1] Italic numbers in parentheses refer to Literature cited, p. 240.

[2] For a more detailed description of the physiography of the coun... relation to the soils, see the section on Soil A...

The lay of the land is prevailingly rolling and hilly, but some areas on the ridges underlain by the more resistant rock are steep and rather rugged. Elevations above sea level range from 740 feet, at the surface of Clinch River where it leaves the county, to 2,128 feet, at the highest point on House Mountain. The difference in elevation between the valleys and ridges ranges approximately from 180 to 400 feet, except for House Mountain, which rises approximately 900 feet above the adjacent upland. Approximate elevations in feet above sea level of points that represent the general relief are: French Broad River, where it enters the county, 842; Fort Loudoun Reservoir, 813; the crest of Bays Mountains, a rugged ridge along the Knox-Sevier County line, 1,350 to 1,500; Tarklin Valley, to the northwest of Bays Mountains, 960 to 1,100; the crest of Blackoak Ridge, a ridge underlain by dolomitic limestone, 1,260 to 1,360; Hinds Valley, a valley over shale northwest of and adjacent to Blackoak Ridge, 1,020 to 1,160; and Beaver Ridge, adjacent to and northwest of Hinds Valley, 1,300 to 1,400.

The total area of alluvium is not great, considering the size of the streams that flow through the county. The larger alluvial plains are along the Tennessee, French Broad, Holston, and Clinch Rivers. The first bottoms, or flood plains, lie as narrow strips along the channels. Most of the bottoms are 300 to 800 feet wide; a few are about one-half mile wide. The stream terraces or benches are 15 feet to about 140 feet above the adjacent first bottoms. These terraces lie in irregular, discontinuous areas in the vicinity of the large streams. Few are as much as one-half mile wide.

The older, higher lying areas of terraces represent remnants of very old alluvial plains. Subsequent erosion has developed a rolling to hilly surface, and the alluvium ranges from scattered cobblestones on sedentary material to a layer 20 or 30 feet thick. The alluvium along the French Broad and Tennessee Rivers is a mixture of materials originating from shales, limestones, sandstones, and metamorphosed micaceous rocks. Along the other streams it is the same except for the lack of materials from micaceous rocks.

The drainage system is well developed. The larger streams flowing in the valleys form the main stems of a trellis system. In many places, streams flow through gaps in the ridges. In those parts of the county overlying dolomitic limestone, a karstlike topography prevails. Here a great many of the small drains lead to sinkholes, where the runoff water enters subterranean channels. Part of the runoff water, however, proceeds through a partially formed dendritic surface system to permanent surface streams in the shale valleys. Poorly drained areas are confined to small tracts along some of the drainageways and first bottoms and on floors of some of the sinkholes.

The French Broad and Holston Rivers, draining the eastern part of the county, converge about 4 miles east of Knoxville to form the Tennessee River. The northwest third of the county drains to the Clinch River, which joins the Tennessee River in the vicinity of Kingston in Roane County.

CLIMATE

The climate of Knox County is of the modified continental type. According to the classification of weather by Koppen (*15*), it has a warm and temperate climate with no distinct dry season but with hot summers in which the temperature of the warmest month averages 76.7° F. Long hot or cold periods are not common. Seasonal changes are usually gradual. The nearby mountains apparently have a moderating effect on weather in the Valley of East Tennessee. The United States Weather Bureau summary states: "The high mountains on the southeast act as a barrier to divert the hot southerly winds which occur when the presure is high off the South Atlantic Coast, with the result that the maximum temperatures experienced in this valley are lower than those beyond the mountains in any direction. On the other hand, the Cumberland Plateau on the northwest retards and weakens the force of cold waves." The mountains also break the force of winds, as tornadoes are almost unknown in the valley and average wind velocity is low.

The generally mild and open winters allow outdoor farm work throughout the year. Many plants retain their green leaves through the winter. Native flowers bloom during most months of the year. Winter vegetables, winter grains, and perennials rarely suffer damage from cold. The average date of the last killing frost in spring is April 1, and that of the first in fall is October 28. The ground is seldom frozen to a depth of more than 2 inches and rarely remains frozen for more than a few hours. The alternate freezing and thawing tends to loosen the surface soil, however, and to render it especially susceptible to erosion. Winter crops are sometimes damaged by heaving. Moderate climatic conditions favor the raising of livestock and poultry, but fruits are often killed by freezes that follow warm spells in early spring.

The hills and the narrow intervening valleys of the county are favorable for nocturnal radiation. Almost without exception, cool and comfortable nights follow high temperatures during the day. The weather is seldom too severe for the enjoyment of outdoor recreation such as golf, hiking, and fishing.

The more important climatic data for the county, compiled from the records of the United States Weather Bureau Station at Knoxville, are given in table 1.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Knoxville, Knox County, Tenn.*

[Elevation, 974 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Total for the driest year	Total for the wettest year	Average snowfall
	° F.	° F.	° F.	Inches	Inches	Inches	Inches
December	39.1	75	−5	4.52	2.30	7.21	2.1
January	38.6	74	−16	4.66	2.19	6.92	2.7
February	40.8	79	−10	4.51	3.78	10.18	2.4
Winter	39.5	79	−16	13.69	8.27	24.31	7.2
March	47.5	88	5	5.05	4.41	13.07	1.4
April	57.3	93	23	4.14	1.39	5.86	.2
May	66.7	95	34	3.75	4.21	1.23	(3)
Spring	57.2	95	5	12.94	10.01	20.16	1.6
June	73.8	99	42	4.10	2.60	4.96	0
July	76.7	104	52	4.36	1.86	7.64	0
August	75.4	101	50	3.92	2.03	5.60	0
Summer	75.3	104	42	12.38	6.49	18.20	0
September	69.4	102	35	2.68	4.56	4.14	0
October	58.5	94	24	2.62	1.44	2.81	(3)
November	46.5	80	8	3.07	2.90	4.25	.3
Fall	58.1	102	8	8.37	8.90	11.20	.3
Year	57.5	104	−16	47.38	[4] 33.67	[5] 73.87	9.1

[1] Average temperature based on 78-year record, 1870 to 1947; highest and lowest temperatures from 61-year record, 1870 to 1930.

[2] Average precipitation based on 79-year record, 1870 to 1948; wettest and driest years based on 81-year record, 1870 to 1950; snowfall on 48-year record, 1883 to 1930.

[3] Trace.

[4] In 1930.

[5] In 1875.

VEGETATION

According to the classification of natural vegetation by Shantz and Zon (*11*), this county is in the chestnut-chestnut oak-yellow poplar belt of the Eastern forest region. The original vegetation was predominantly hardwoods and mixed hardwoods and pines. Chestnut, chestnut oak, white, red, and post oaks, hickory, ash, elm, maple, gum, beech, holly, white poplar, yellow-poplar, and yellow pine were the dominant species. Approximately 92,500 acres are now forested (*12*). Second-growth oak, hickory, dogwood, and shortleaf pine predominate in the present forest cover. Smaller proportions of yellow-

remains, and all the chestnut trees were killed by a blight before about 1930.

Most of the cleared land in farms is used for crops and pasture, although there is a notable acreage idle. On idle land and poorly managed pastures, the vegetation consists largely of wild grasses, broomsedge and other weeds, blackberry, persimmon, and sassafras. Volunteer stands of shortleaf pine are well established on many abandoned areas. A few areas have been planted to shortleaf and loblolly pine, and some to black locust and black walnut.

WATER SUPPLY

This county has a varied and, in most sections, abundant supply of water for livestock and household use. The rivers that drain the county supply some farms with stock water. Several large creeks and their permanent tributaries supply running water to a relatively large number of farms. Most of the creeks are moderately swift and clear except during flood periods. During the winter, spring, and early summer, enough water is available in practically all parts of the county. Late in summer and early in fall many small streams are dry and in some areas shallow wells are not reliable.

In the valleys of the cherty ridges of the Fullerton-Bolton-Clarksville soil association, larger streams generally flow continously; but permanent springs are not numerous, and many dug and bored wells commonly fail in exceptionally dry periods. Consequently, many farms in this section depend either partially or entirely on cisterns and artificial ponds for water. Permanent springs and streams, natural ponds, and reliable bored wells are common in the limestone valleys (Decatur-Dewey-Emory and Stony land-Talbott soil associations). Dug and bored wells in the shale valleys (Jefferson-Montevallo, Sequoia-Leadvale, and Sequoia-Litz-Dandridge soil associations) are widely used and dependable. A few springs and permanent streams are in these areas also. An abundant supply of water is available from streams, wells, and springs on the first bottoms along the rivers and creeks. Water is commonly available either from the streams or wells in the valley parts of the Dandridge-Litz-Leadvale and Tellico-Neubert soil associations.

Fort Loudoun Lake is the reservoir for the water impounded by Fort Loudoun Dam, on the Tennessee River about 30 miles downstream from Knoxville. The dam is one of a series built by the Tennessee Valley Authority on the Tennessee River and its tributaries for flood control, navigation, and the generation of electricity. The lake covers about 13 square miles, with a total shoreline of about 343 miles. It extends about 35 miles upstream to the confluence of the Holston and the French Broad Rivers. There are a few other small ponds or lakes in the county. Some are natural lakes in sinkholes and a few were formed by damming small streams.

Fort Loudoun Reservoir and some of the smaller bodies of water provide facilities for boating, fishing, and swimming.

WILDLIFE

bedrock, the extent of erosion, or artificial drainage, for example, are characteristics that might cause a surveyor to divide a soil type into phases.

Two or more soil types may have similar profiles; that is, the soil layers may be nearly the same, except that the texture, especially of the surface layer, may differ. As long as the other characteristics of the soil layers are similar, these soils are considered to belong in the same soil series. A soil series therefore consists of all soil types, whether the number be only one or several, that are, except for texture—particularly the texture of the surface layer—about the same in kind, thickness, and arrangement of layers.

The name of a place near where a soil series was first found is chosen as the name of the series; thus, Colbert is the name of a soil series found in Colbert County, Alabama. Two types of the Colbert series are found in Knox County, Tenn.—Colbert silty clay loam and Colbert silty clay. Each of these soil types has a distinct surface soil texture, as its name indicates.

When very small areas of two or more kinds of soil are so intricately mixed they cannot be shown separately on a map of the scale used, they are mapped together, and the areas of the mixture are called a soil complex. Muskingum-Lehew fine sandy loams is a complex of Muskingum fine sandy loam and Lehew fine sandy loam in Knox County.

Gullied land, limestone rockland, and stony land that have little agricultural value or little true soil are known as miscellaneous land types and are not designated with series and type names but are given descriptive names, as Gullied land (Armuchee and Litz soil materials) Limestone rockland (rolling and hilly) and Stony very steep land (Muskingum soil material).

The soil type or, where the soil type is subdivided, the soil phase, is the mapping unit in soil surveys. It is the unit, or the kind of soil, that is most nearly uniform and has the narrowest range of characteristics. For this reason land-use and soil-management practices can be more definitely specified for it than for broader groups of soils that include more variation.

THE SOILS OF KNOX COUNTY, THEIR USE AND MANAGEMENT

GENERAL NATURE OF THE SOILS

Soils on uplands occupy about 76 percent of the county; those on alluvial foot slopes and along drains, 14 percent; those on stream terraces, 3 percent; and those on first bottoms, 7 percent.

The upland soils have formed over high-grade limestone, cherty limestone, clayey or argillaceous limestone, calcareous shale, interbedded shale and limestone, calcareous sandstone, acid shale, or interbedded shale and sandstone. Soils on uplands have greater range in characteristics and in use suitability and management requirements than those of the other groups. Most of the steep and all of the shallow soils are of this group, as well as some of the smoothest and

areas of more than 50 acres, except along the foot of the steep shaly ridges. In great part, the soils of this group are suited to crops; practically all of them not suited to crops are suited to pasture. These soils require more exacting management than those on first bottoms, as they are lower in fertility, more susceptible to erosion, and more difficult to work and maintain.

The soils on stream terraces and those on first bottoms are chiefly along the Holston, French Broad, Clinch, and Tennessee Rivers and Bullrun Creek. Much of the acreage of these soils is well suited to crops and a great part is used for this purpose. The areas on first bottoms are subject to flooding, although those along the four rivers have been largely freed of this hazard by dams upstream designed to retain floodwaters.

About 20 percent of the county has a steep surface, with slopes of more than 25 percent; 25 percent has a hilly surface, with slopes from 12 to 25 percent. In great part, these steep and hilly soils are on uplands, and a large acreage is shallow to bedrock. On the whole these soils are not well suited to cultivation, and in large part the steep shallow areas are suitable only to forest. Approximately 30 percent of the county has a rolling surface ranging from 5 to 12 percent; 17 percent has an undulating surface ranging from 2 to 5 percent; and 8 percent is nearly level. Soils of these three slope groups are predominantly fair to excellent for crops, although stoniness, compactness, and shallow depth to bedrock make a notable acreage poorly suited to this use. Practically all the soils of the first bottoms are nearly level. Most of those on stream terraces, on foot slopes, and along drains are undulating and rolling. Soils on the uplands range from undulating to steep.

The surface or plow layers of a great part of the soils have textures ranging from loam to silty clay loam. Silt loams and silty clay loams predominate in the soils developed over limestone; loams and clay loams in the Tellico-Neubert soil association; and fine sandy loams and clay loams in the Muskingum-Lehew soil association. Many of the soils on colluvium adjacent to the Muskingum-Lehew association have loam or fine sandy loam surface layers. A notable part of the acreage on the broader first bottoms has a loam or fine sandy loam texture. A very small amount of loamy fine sand is included with Staser fine sandy loam. The severely eroded Colbert soil, as well as some of the severely eroded Talbott soil, has a silty clay or clay plow layer. Practically all of the silty clay loam and clay loam soils are former areas of silt loams and loams, respectively, that have lost through erosion either all or a considerable part of their original surface layers.

Various degrees of stoniness are common over much of the county. About 50 percent of the soil area is stone-free or at least not stony enough to materially interfere with tillage. Almost all the soils on first bottoms are stone-free, and much of the acreage on stream terraces and in the Decatur-Dewey-Emory, the Fullerton-Bolton-Clarksville, the Tellico-Neubert, and the Sequoia-Leadvale soil associations are practically stone-free. About 39 percent of the county is occupied by soil sufficiently stony to interfere materially with but not to prevent land, Waynesboro, and Nolichucky soils) have cobblestones that interfere materially with tillage. Almost 11 percent of the county is so stony that tillage is impractical. Stoniness makes areas of the Stony land-Talbott and the Muskingum-Lehew soil associations unfit even for grazing. Less extensive areas too stony for practical cultivation are in the Sequoia-Leadvale, the Sequoia-Litz-Dandridge, the Dandridge-Litz-Leadvale, the Tellico-Neubert, the Sequoia-Bland-Leadvale, and the Bland-Camp soil associations.

Depth to bedrock ranges from practically nothing to more than 20 feet. Soils having depths of more than 5 feet occupy about 57 percent of the county. A great part of the soils on first bottoms, stream terraces, and practically all of the Decatur, Dewey, Fullerton, and Clarksville soils are well over 5 feet deep. In places soils on foot slopes and along drains have bedrock within less than 5 feet of the surface, but a large part has greater depth. Soils having depths ranging from about 18 inches to 5 feet make up almost 14 percent of the county. The Sequoia and Talbott and a notable proportion of the soils on foot slopes and along drains are of this thickness. The rest of the county is occupied mainly by soils having an average depth to bedrock of less than 20 inches; chief among these are the Dandridge, Litz, Montevallo, Armuchee, Bland, Muskingum, and Lehew soils. The stony land types have an average depth to bedrock of less than 18 inches; the limestone-rockland miscellaneous land types have bedrock at the surface over a great part of their area.

On a large acreage of the soils permeability is favorable for the crops commonly grown. The Huntington, Congaree, Staser, Etowah, Neubert, Alcoa, Emory, Abernathy, and Greendale soils have the most favorable moisture relations. The capacity to hold moisture available to crops is somewhat restricted in many of the other soils deep to bedrock and is notably limited in those soils shallow to bedrock.

About 15 percent of the acreage of the county is high in natural fertility, 47 percent moderate, and 38 percent rather low. The most fertile soils are the Huntington, Lindside, Congaree, Chewacla, Emory, Abernathy, Ooltewah, Neubert, Alcoa, Etowah, Cumberland, Decatur, Dewey, and Farragut. A great part of their acreage is in the Cumberland-Huntington and the Decatur-Dewey-Emory soil associations (pl. 2, *A* and *B*). The associations consisting predominantly of soils of low fertility are the Muskingum-Lehew, the Montevallo, and the Jefferson-Montevallo.

In the agriculture commonly practiced, about 51 percent of the county acreage is suited to crops that require tillage (First-, Second-, and Third-class soils). About 25 percent is not suited to crops but suitable for pasture (Fourth-class soils). Approximately 24 percent is poorly suited to either crops or pasture (Fifth-class soils). The 51 percent suited to crops requiring tillage is divided as follows: 6 percent, very well suited (First-class soils); 28 percent, well suited (Second-class soils); and 17 percent, fairly well suited (Third-class soils).

First- and Second-class soils predominate in the Cumberland-Huntington, the Staser-Hamblen, and the Decatur-Dewey-Emory soil associations; Second-, Third-, and Fourth-class soils in the Fullerton-Bolton-Clarksville and the Sequoia-Leadvale; Fourth-class soils in the Armuchee-Leadvale, the Dandridge-Litz-Leadvale, and the Stony

The soil series of Knox County are grouped in table 2 according to their position on the landscape, and some of their distinguishing characteristics are given. Of the five soil series on uplands common to the limestone valleys, the Decatur and Dewey are the most important. They are recognized by their red subsoils, generally great depth to bedrock, and relatively high natural fertility. They are among the most desirable soils for the production of crops and pasture. The Talbott, Colbert, and Bland soils are more clayey and have a heavier consistence than the Decatur and Dewey soils. They are notably shallower to bedrock and have a lower fertility. The Talbott soils are distinguished from the Colbert in having a red rather than yellow clay subsoil and average a little deeper to bedrock. The Bland soils are distinguished by their dusky-red color. They are not limited to limestone valley positions, as a large part of their acreage is on steep rugged ridges, so strongly sloping and shallow to bedrock in many places as to be poorly suited to cultivation.

The Fullerton, Clarksville, and Bolton soils are on gravelly or cherty ridges and, like the Decatur and Dewey soils, are interassociated in many places. In general, however, the Clarksville soils are more common along the northwestern parts of the cherty ridge belts. On the whole, the Fullerton acreage predominates on these ridges, whereas the Bolton soils are limited to areas of 5 to 40 acres, which are numerous and widely distributed. All of these soils are deep to bedrock limestone, most of which is dolomitic. The Fullerton soils are distinguished by their reddish-yellow subsoil, and the Clarksville by their yellow subsoil. The Bolton soils are distinguished by their decidedly brown surface soil, those of the Clarksville and Fullerton being comparatively gray. The Clarkesville soils are notably low in fertility, the Fullerton are moderate, and the Bolton approach the higher fertility of the Dewey.

The Farragut, Montevallo, much of the Sequoia, and some of the Litz and Dandridge soils occupy the upland parts of the shale valleys. The Farragut soils have surface layers and sublayers to a depth of 18 or 20 inches similar to those of the Decatur. They differ in that they have shale at a depth of 1½ to 4 feet, whereas the Decatur soils are underlain by limestone at a greater depth. The Sequoia soils have lighter colored surface soils and subsoils than the Farragut and are less fertile, although under good management they are productive. The Litz, Dandridge, and Montevallo soils are very shallow to shale, and the surface layer commonly has at least a moderate amount intermixed. All are of low fertility, but of the three, the Dandridge is the most productive.

The Dandridge, Litz, and Armuchee soils of the shale hills are all shallow to bedrock and have hilly to steep slopes. The Dandridge and Litz areas are so intricately intermixed that they are mapped together. The Dandridge soils are shallow to calcareous (limy) shale bedrock, whereas the Litz soils rest on leached (soft) shale to depths ranging from 4 to 8 feet, under which there is generally calcareous shale. The Armuchee soils are underlain by interbedded limestone and shale. Soils of all three series, though not well suited to cultivation, are moderately productive of the common pasture grasses and legumes.

TABLE 2.—*Distinguishing characteristics of soil series in Knox County, Tenn.*

SOILS ON UPLANDS

Topographic position and soil series	Parent rock or parent material	Description	Dominant relief
Limestone valleys:			
Decatur	High grade limestone	Dark-brown surface soil; brownish-red silty clay subsoil.	Undulating to hilly.
Dewey	do	Grayish-brown surface soil; yellowish-red silty clay subsoil.	Undulating to steep.
Talbott	Clayey (argillaceous) limestone	Grayish-brown surface soil; red plastic clay subsoil.	Undulating to hilly.
Colbert	do	Brownish-gray surface soil; yellow very plastic clay subsoil.	Do.
Bland	Dusky-red [1] shaly limestone	Dusky-red surface soil; dusky-red silty clay subsoil.	Rolling to hilly.
Steep purplish limestone ridges:			
Bland	do [1]	do	Hilly to steep.
Cherty ridges (gravelly or cherty ridge lands):			
Fullerton	Moderately cherty limestone	Brownish-gray surface soil; reddish-yellow moderately cherty silty clay subsoil.	Undulating to steep.
Clarksville	Very cherty limestone	Gray surface soil; brownish-yellow very cherty silty clay subsoil.	Rolling to steep.
Bolton	Sandy limestone or limestone with thin sandy layers.	Dark-brown surface soil; reddish-brown silty clay loam to silty clay subsoil.	Do.
Shale valleys:			
Sequoia	Interbedded shale and limestone or calcareous (limy) shale.	Brownish-gray surface soil; reddish-yellow silty clay subsoil.	Undulating to hilly.
Farragut	High grade limestone over acid shale.	Brown surface soil; reddish-brown silty clay subsoil.	Do.
Montevallo	Acid shale	Yellowish-gray surface soil; brownish-yellow very shaly silty clay loam subsoil.	Undulating to steep.
Litz	Leached shale or shale interbedded with some limestone.	Yellowish-gray surface soil; brownish-yellow shaly silty clay loam subsoil.	Hilly to steep.
Shale hills:			
Dandridge	Calcareous (limy) shale (blue slate land).	Grayish-yellow surface soil; brownish-yellow shaly silty clay loam subsoil.	Do.
Litz	Leached shale	Yellowish-gray surface soil; brownish-yellow shaly silty clay loam subsoil.	Do.
Armuchee	Interbedded limestone and shale	Brownish-gray surface soil; yellowish-red and yellow silty clay subsoil.	Do.
Steep sandy and shaly ridges:			
Lehew	Dusky-red sandy shale	Weak-red surface soil; weak- to dusky-red friable clay loam subsoil.	Do.
Muskingum	Sandstone or interbedded sandstone and shale.	Brownish-gray surface soil; light-yellow stony sandy loam or loam subsoil.	Do.
Red sandy ridges:			
Tellico	Calcareous sandstone	Light reddish-brown surface soil; dark-red sandy clay subsoil.	Rolling to steep.

SOILS ON FOOT SLOPES AND ALONG DRAINS

Topographic position and soil series	Parent rock or parent material	Description	Dominant relief
Drainheads and drainageways in limestone valleys:	Colluvium and local alluvium chiefly from—		
Emory	Decatur, Dewey, and Farragut soils.	Brown surface soil; light reddish-yellow to yellowish-brown silty clay loam subsoil.	Undulating to rolling.
Drainheads and drainageways in cherty ridges:			
Greendale	Fullerton and Clarksville soils	Brownish-gray surface soil; light brownish-yellow to yellowish-brown silty clay loam subsoil.	Do.
Sinkholes in limestone valleys and on cherty ridges:			
Abernathy	Decatur, Dewey, and Farragut soils.	Brown or reddish-brown surface soil; reddish or yellowish-brown silt loam subsoil.	Nearly level.
Ooltewah	Decatur, Dewey, Farragut, Fullerton, and Clarksville soils.	Grayish-brown to brown surface soil; yellowish-brown mottled below 18 to 24 inches.	Do.
Guthrie	Fullerton, Talbott, Colbert, and Sequoia soils.	Gray surface soil; gray, mottled with yellow and brown, clay subsoil.	Do.

[1] Commonly called purplish-red or Indian red.

263400—53——2

TABLE 2.—*Distinguishing characteristics of soil series in Knox County, Tenn.*—Continued

Topographic position and soil series	Parent rock or parent material	Description	Dominant relief
SOILS ON FOOT SLOPES AND ALONG DRAINS			
Drainageways and foot slopes below steep dusky-red limestone:			
Camp	Bland soils	Weak-red to dusky-red surface soil; dusky-red silty clay loam subsoil.	Gently sloping to sloping.
Relatively high foot slopes below steep sandy shaly ridges:			
Jefferson	Muskingum and Lehew soils	Grayish-yellow surface soil; brownish-yellow clay loam subsoil.	Undulating to rolling.
Drainheads and drainageways below steep sandy and shaly ridges:			
Cotaco	Muskingum, Lehew, and Jefferson soils.	Yellowish-gray surface soil; mottled yellow, gray, and brown clay loam subsoil.	Do.
Drainheads and drainageways in shale valleys and hills:			
Leadvale	Dandridge, Armuchee, Sequoia, Litz, Montevallo, Muskingum, and Lehew soils.	Gray surface soil; yellow grading to mottled silty clay loam subsoil.	Do.
Whitesburg	Dandridge, Armuchee, Litz, and Sequoia soils.	Brownish-gray surface soil; yellow grading to mottled silt loam or silty clay loam subsoil.	Do.
Relatively high foot slopes below red sandy ridges:			
Alcoa	Tellico soils	Brown surface soil; yellowish-red silty clay loam subsoil.	Do.
Drainheads and drainageways below red sandy hills:			
Neubert	do	Reddish-brown surface soil; brownish-red clay loam subsoil.	Do.
SOILS ON STREAM TERRACES			
High stream terraces:			
Cumberland	Mixed alluvium strongly influenced by limestone.	Brown surface soil; red silty clay subsoil	Undulating to hilly.
Waynesboro	Mixed alluvium from shale, sandstone, and limestone.	Grayish-brown surface soil; red sandy clay subsoil.	Do.
Nolichucky	do	Gray surface soil; reddish-yellow sandy clay subsoil.	Rolling.
Moderately high stream terraces:			
Etowah	Mixed alluvium strongly influenced by limestone.	Grayish-brown surface soil; yellowish-brown, with a reddish cast, silty clay loam subsoil.	Undulating to hilly.
Tyler	Mixed alluvium from shale, sandstone, and limestone.	Light-gray surface soil; mottled gray and yellow clay subsoil.	Nearly level.
Low stream terraces:			
Wolftever	Mixed alluvium from limestone, shale, and sandstone.	Light-brown surface soil; light yellowish-brown compact silty clay subsoil.	Undulating to rolling.
Sequatchie	Predominantly sandy alluvium	Grayish-brown surface soil; brownish-yellow sandy clay loam subsoil.	Do.
SOILS ON FIRST BOTTOMS			
Huntington	Mixed alluvium apparently strongly influenced by limestone.	Brown surface soil; brown or yellowish-brown subsoil.	Nearly level.
Lindside	do	Brown surface soil; mottled silty clay loam subsoil.	Do.

TABLE 2.—*Distinguishing characteristics of soil series in Knox County, Tenn.*—Continued

SOILS ON FIRST BOTTOMS—Continued

...ographic position and soil series	Parent rock or parent material	Description	Dominant relief
...in	Mixed alluvium apparently strongly influenced by limestone.	Brownish-gray surface soil; mottled gray and yellow silty clay subsoil.	Nearly level.
...ie	Alluvium from Clarksville and Fullerton soils.	Grayish-brown cherty surface soil; yellowish-brown or yellowish-gray cherty compact silty clay loam subsoil.	Do.
...er	Mixed alluvium derived chiefly from shale, much of which was calcareous or limy.	Grayish-brown surface soil; yellowish-brown fine sandy loam to silt loam subsoil.	Nearly level to very gently undulating.
...ablen	do	Light yellowish-brown surface soil; mottled gray, brown, and yellow silty clay loam subsoil.	Nearly level.
...er	do	Light-gray surface soil; light-gray somewhat mottled clay subsoil.	Do.
...garee	Mixed alluvium, much of which was derived from micaceous rocks.	Brown surface soil and subsoil with much mica throughout.	Nearly level to very gently undulating.
...wacla	do	Brown surface soil; mottled gray, yellow, and brown subsoil.	Nearly level.

The Lehew and Muskingum soils, like the Dandridge, Litz, and Armuchee, are shallow to bedrock and have hilly to steep slopes. Their parent rocks, however, are acid or low in lime, and the soils are much less productive of pasture or crops than the Dandridge, Litz, and Armuchee. Soils of the Lehew and Muskingum series occur intermixed on the steep sandy shale ridges, such as Sharp and Beaver Ridges. Muskingum soils occupy all of House Mountain.

The Tellico soils are dusky-red sandy soils on the steep rugged ridges, such as Brown Mountain southeast of Knoxville. The range in depth to bedrock is greater than for the shale-hill soils, and the smoother parts, though limited in extent, are well suited to cultivation. The color of the Tellico soils somewhat resembles that of the Decatur, but the subsoil is much more friable and permeable and the natural fertility is lower.

Of the soils occurring on foot slopes and along drains, those on local alluvium and colluvium—the Emory, Greendale, Camp, Abernathy, Ooltewah, and Guthrie—consist of material derived chiefly from limestone. The Abernathy, Ooltewah, and Guthrie occupy sinkholes and differ from each other chiefly in degree of drainage. The Abernathy has the best drainage, and the Guthrie the poorest.

Emory soils are associated chiefly with Decatur, Dewey, and Farragut soils and usually lie on gentle foot slopes around sinkholes occupied by Abernathy soils. The Abernathy and Emory soils are among the most productive in the county and are suited to a wide variety of crops, although crops on the Abernathy are damaged at times by temporary flooding.

The Greendale soils, like the Emory, occupy foot slopes but consist of the somewhat less fertile local alluvium washed from the Fullerton and Clarksville soils. They are more yellowish than the Emory soils. The Camp series includes the dusky-red soils on foot slopes of local alluvium associated with the Bland soils. Though rather high in clay, they are well suited to crops and are productive of most crops commonly grown.

Jefferson and Cotaco soils consist of local alluvium and colluvium from the Muskingum and Lehew. The Jefferson soils are older than the Cotaco, occupy the more rolling higher foot slopes adjacent to Muskingum and Lehew ridges, and are well drained. In contrast, the Cotaco soils consist of young more gently sloping alluvium along the drainageways leading out from these ridges and have slow internal drainage as indicated by their mottled subsoil. In large part, Cotaco and Jefferson soils are suited to crops, but their natural fertility is much lower than that of the Emory soils.

The Leadvale and Whitesburg soils consist of local alluvium and colluvium from shale areas. The Leadvale occupies the higher, older, more sloping areas, and the Whitesburg the narrow strips of young alluvium along the drainageways. They occupy the local alluvial areas throughout the shale ridges and valleys and were mapped together as phases of Leadvale and Whitesburg silt loams. The Whitesburg soils are distinguished by their slightly acid to slightly alkaline reaction, as compared with the more acid reaction of the Cotaco, Jefferson, and Leadvale series.

Neubert soils lie as gently sloping strips at drain heads and along the upper reaches of the drainageways. Both soils are friable and permeable and have better internal drainage than the Leadvale, Cotaco, and Whitesburg soils. They are productive and among the most desirable soils for crops.

The Cumberland and Etowah are well-drained silty soils on the older stream terraces. They are classified with those soils of the stream terraces that consist predominantly of limestone material or have been strongly influenced by it. The Cumberland approximate the Dewey soils in color. In places they are as brown in the surface soil and as red in the subsoil as the Decatur soils. The Etowah soils are somewhat less brown in the surface soil and less reddish in the subsoil and are more friable than the Cumberland. In general they occupy somewhat lower positions, the Cumberland occupying chiefly the highest stream terraces. Both of these soils are fertile and much of their acreage is good cropland.

Like the Cumberland and Etowah, the Waynesboro and Nolichucky soils are well drained. They differ chiefly in being noticeably more sandy and are classed as a mixed general alluvium to which sandstones or other sand-bearing rocks have made a large contribution. Both occupy high stream terraces comparable to those on which Cumberland soils occur. The Waynesboro has a browner surface soil and a redder subsoil and is more fertile than the Nolichucky. Much of their aggregate area is suited to crops.

The Tyler soil represents the poorly or very poorly drained soils on stream terraces. It is associated with soils of the lower terraces; very little or no acreage is associated with the Cumberland, Waynesboro, and Nolichucky of the high stream terraces. It also includes the very poorly drained areas on local alluvium in the shale valleys, where it is associated with Leadvale and Whitesburg soils. The Tyler soil is poorly suited to most crops that require tillage.

Wolftever and Sequatchie soils occupy low stream terraces and are mostly located along the Holston, French Broad, Clinch, and Tennessee Rivers. Wolftever soils are moderately fertile but have a rather compact subsoil; their internal drainage in most places is somewhat impaired, and the soil may be subject to occasional flooding. Sequatchie soils are sandy and permeable. Wolftever and Sequatchie soils are well suited to crops requiring tillage.

The Huntington, Roane, Staser, and Congaree are well-drained soils on first bottoms along the Tennessee River, which carries micaceous sediments from the Blue Ridge physiographic province. The Congaree is distinguished by its high content of mica, as it consists chiefly of alluvium originating from schist, gneiss, and granite. The Chewacla is an imperfectly drained soil associated with the Congaree.

The Huntington soils, located mainly along the Holston River, are distinguished by their rich-brown color and friable silt loam texture. Their parent alluvium is thought to consist largely of material originating from limestone, although considerable amounts of shale and sandstone are intermixed.

Lindside and Melvin soils are the imperfectly and poorly drained soils, respectively, that are associated with the Huntington. They occupy a large part of the first bottoms along creeks that drain wholly or in part from soils over limestone. Very little alluvium along these creeks is sufficiently well drained to be classified as Huntington soil.

The Huntington and Lindside soils are among the most fertile soils of the county.

The Roane soils border creeks carrying sediments from the more extensive areas of Fullerton and Clarksville soils. They are moderately well drained, contain more chert, and are lower in fertility than the Huntington soils. In places, the cherty substratum is partly cemented.

The Staser, Hamblen, and Prader soils consist chiefly of alluvium of shale and mixed shale and sandstone origin that is slightly acid to slightly alkaline. Much of this alluvium originated from calcareous shales or interbedded shale and limestone. The Staser soils are well drained and are lighter brown and average lower in fertility than the Huntington. The Hamblen soils are imperfectly drained and the Prader soils are poorly drained.

SOIL TYPES AND PHASES

In this section the various soils of the county are described in detail and their relation to agriculture—including present use and management, use suitability, and management requirements—are set forth as far as present knowledge permits. The acreage and proportionate extent of each soil are given in table 3, and its location and distribution are represented on the detailed soil map that accompanies this report.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Knox County, Tenn.*

Soil	Acres	Percent
Alcoa silt loam:		
Eroded rolling phase	193	0.1
Eroded undulating phase	334	.1
Armuchee silt loam, steep phase	2,261	.7
Armuchee silty clay loam:		
Eroded hilly phase	415	.1
Eroded steep phase	754	.2
Bland silt loam:		
Rolling phase	139	(1)
Steep phase	1,115	.3
Bland silty clay loam:		
Eroded hilly phase	581	.2
Eroded rolling phase	559	.2
Eroded steep phase	682	.2
Bolton silt loam:		
Eroded hilly phase	1,227	.4
Eroded rolling phase	2,356	.7
Eroded steep phase	528	.2
Bolton silty clay loam:		
Severely eroded hilly phase	1,186	.4
Severely eroded rolling phase	244	.1
Severely eroded steep phase	851	.3
Camp silt loam	210	.1
Chewacla silt loam	271	.1
Clarksville cherty silt loam:		
Eroded hilly phase	2,420	.7
Eroded rolling phase	3,120	.9
Eroded steep phase	1,118	.3
Hilly phase	2,900	.9
Rolling phase	2,864	.9
Steep phase	7,733	2.3

See footnote at end of table.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Knox County, Tenn.*—Continued

Soil	Acres	Percent
Colbert silty clay:		
Severely eroded hilly phase	282	.1
Severely eroded rolling phase	512	.1
Colbert silty clay loam:		
Eroded rolling phase	464	.1
Eroded undulating phase	198	.1
Congaree fine sandy loam	390	.1
Low-bottom phase	447	.1
Congaree silt loam	783	.2
Low-bottom phase	92	(1)
Cumberland gravelly fine sandy loam, eroded rolling phase	299	.1
Cumberland silty clay loam:		
Eroded hilly phase	439	.1
Eroded rolling phase	978	.3
Eroded undulating phase	205	.1
Severely eroded hilly phase	269	.1
Severely eroded rolling phase	124	(1)
Dandridge and Litz shaly silt loams:		
Eroded hilly phases	9,797	3.0
Eroded steep phases	2,834	.9
Dandridge and Litz silt loams:		
Hilly phases	1,224	.4
Steep phases	2,352	.7
Dandridge shaly silt loam:		
Eroded hilly phase	934	.3
Eroded steep phase	812	.2
Dandridge silt loam, steep phase	576	.2
Decatur silt loam:		
Rolling phase	136	(1)
Undulating phase	377	.1
Decatur silty clay loam:		
Eroded hilly phase	305	.1
Eroded rolling phase	2,606	.8
Eroded undulating phase	1,556	.5
Severely eroded hilly phase	636	.2
Severely eroded rolling phase	328	.1
Dewey silt loam:		
Rolling phase	153	(1)
Undulating phase	227	.1
Dewey silty clay loam:		
Eroded hilly phase	953	.3
Eroded rolling phase	5,504	1.7
Eroded steep phase	180	(1)
Eroded undulating phase	1,257	.4
Severely eroded hilly phase	1,831	.6
Severely eroded rolling phase	959	.3
Emory and Abernathy silt loams	1,165	.4
Emory silt loam:		
Rolling phase	1,207	.4
Undulating phase	9,076	2.8
Etowah silt loam, undulating phase	208	.1
Etowah silty clay loam:		
Eroded hilly phase	179	(1)
Eroded rolling phase	1,086	.3
Eroded undulating phase	907	.3
Severely eroded hilly phase	238	.1
Farragut silty clay loam:		
Eroded hilly phase	167	(1)
Eroded rolling phase	658	.2
Eroded undulating phase	421	.1

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Knox County, Tenn.*—Continued

Soil	Acres	Percent
Fullerton cherty silt loam:		
Eroded hilly phase	4,596	1.4
Eroded rolling phase	6,813	2.1
Eroded steep phase	3,853	1.2
Hilly phase	3,545	1.1
Rolling phase	2,143	.7
Steep phase	6,028	1.8
Fullerton cherty silty clay loam:		
Severely eroded hilly phase	2,484	.8
Severely eroded rolling phase	505	.1
Severely eroded steep phase	1,583	.5
Fullerton loam:		
Eroded hilly phase	1,062	.3
Eroded rolling phase	4,074	1.2
Eroded undulating phase	224	.1
Hilly phase	188	.1
Rolling phase	373	.1
Undulating phase	187	.1
Fullerton silt loam:		
Eroded hilly phase	5,406	1.6
Eroded rolling phase	11,774	3.6
Eroded undulating phase	1,014	.3
Hilly phase	1,091	.3
Rolling phase	1,208	.4
Undulating phase	327	.1
Fullerton silty clay loam:		
Severely eroded hilly phase	3,979	1.2
Severely eroded rolling phase	929	.3
Greendale cherty silt loam:		
Rolling phase	335	.1
Undulating phase	255	.1
Greendale silt loam:		
Rolling phase	1,568	.5
Undulating phase	8,451	2.6
Gullied land:		
Armuchee and Litz soil materials	8,435	2.6
Fullerton and Talbott soil materials	3,980	1.2
Sequoia and Montevallo soil materials	1,209	.4
Talbott and Decatur soil materials	492	.1
Tellico and Muskingum soil materials	2,182	.7
Guthrie silt loam	644	.2
Hamblen fine sandy loam	1,713	.5
Hamblen silt loam	1,100	.4
Huntington silt loam	779	.2
Low-bottom phase	130	(1)
Jefferson and Montevallo clay loams, severely eroded rolling phases	1,035	.3
Jefferson and Montevallo loams:		
Eroded rolling phases	1,963	.6
Eroded undulating phases	577	.2
Jefferson loam, eroded rolling phase	1,282	.4
Leadvale and Cotaco loams:		
Rolling phases	506	.1
Undulating phases	4,247	1.3
Leadvale and Whitesburg silt loams:		
Rolling phases	536	.2
Undulating phases	13,203	4.0
Limestone rockland:		
Rolling and hilly	2,776	.8
Steep	1,739	.5

See footnote at end of table.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Knox County, Tenn.*—Continued

Soil	Acres	Percent
Lindside silt loam	9, 716	2. 9
Made land	1, 060	. 3
Melvin silt loam	2, 733	. 8
Montevallo shaly silt loam:		
Eroded hilly phase	1, 225	. 4
Eroded rolling phase	1, 719	. 5
Eroded steep phase	213	. 1
Eroded undulating phase	482	. 1
Montevallo silt loam, steep phase	136	(1)
Muskingum-Lehew fine sandy loams:		
Eroded hilly phases	3, 573	1. 1
Eroded steep phases	2, 286	. 7
Hilly phases	373	. 1
Steep phases	12, 760	3. 9
Muskingum stony fine sandy loam, steep phase	476	. 1
Neubert loam:		
Rolling phase	859	. 3
Undulating phase	895	. 3
Nolichucky gravelly loam, eroded rolling phase	545	. 2
Ooltewah silt loam	1, 284	. 4
Prader silt loam	626	. 2
Roane silt loam	1, 942	. 6
Sequatchie fine sandy loam	618	. 2
Sequoia-Bland silty clay loams:		
Eroded hilly phases	208	. 1
Eroded rolling phases	1, 641	. 5
Eroded undulating phases	1, 301	. 4
Severely eroded hilly phases	756	. 2
Severely eroded rolling phases	1, 186	. 4
Sequoia silt loam:		
Rolling phase	787	. 2
Undulating phase	813	. 2
Sequoia silty clay loam:		
Eroded rolling phase	9, 701	2. 9
Eroded undulating phase	7, 918	2. 4
Severely eroded rolling phase	7, 112	2. 2
Severely eroded undulating phase	453	. 1
Staser fine sandy loam	275	. 1
Low-bottom phase	140	(1)
Staser silt loam	933	. 3
Stony hilly and steep land, Colbert and Talbott soil materials	10, 807	3. 3
Stony rolling land, Colbert and Talbott soil materials	5, 627	1. 7
Stony very steep land, Muskingum soil material	807	. 2
Talbott silty clay loam:		
Eroded rolling phase	1, 007	. 3
Eroded undulating phase	318	. 1
Severely eroded hilly phase	384	. 1
Severely eroded rolling phase	327	. 1
Tellico clay loam:		
Severely eroded hilly phase	1, 762	. 5
Severely eroded rolling phase	641	. 2
Severely eroded steep phase	2, 559	. 8
Tellico loam:		
Eroded hilly phase	2, 088	. 6
Eroded rolling phase	3, 279	1. 0
Eroded steep phase	1, 543	. 5
Hilly phase	644	. 2
Rolling phase	276	. 1
Steep phase	4, 942	1. 5

See footnote at end of table.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Knox County, Tenn.*—Continued

Soil	Acres	Percent
Tyler silt loam	176	(1)
Waynesboro clay loam, severely eroded hilly phase	252	0. 1
Waynesboro loam:		
Eroded hilly phase	460	. 1
Eroded rolling phase	968	. 3
Eroded undulating phase	217	. 1
Wolftever silty clay loam:		
Eroded rolling phase	135	(1)
Eroded undulating phase	382	. 1
Total land area	329, 600	100. 0

[1] Less than 0.1 percent.

Alcoa silt loam, eroded undulating phase (2–5% slopes) (AB).—This soil occurs on foot slopes in the general vicinity of higher lying steep and hilly areas of Tellico soils and is composed of colluvium or local alluvium washed from those soils. It is associated with Sequoia and Litz soils of the shale valleys. All of the areas are in the southeastern part of the county, roughly south and east of United States Highway No. 70. The soil has a brownish-red surface where cultivated or bare. A large part is so eroded that much of the plow layer consists of a mixture of original surface and subsoil material. Internal drainage is medium.[4]

Profile description:

0 to 5 inches, reddish-brown silt loam.
5 to 30 inches, yellowish-red firm but friable silty clay loam.
30 inches +, variegated brown, yellow and gray soft weathered shale with harder less weathered shale a few feet below.

The depth to the shaly material ranges from 3 to about 8 feet in most places. Where erosion has not been active, the surface layer is 7 to 12 inches of brown, mellow silt loam.

The reaction is medium to strongly acid, and the natural fertility is moderately high. The soil is easily permeable down to the underlying shale and has large capacity for holding moisture available to plants.

Use and management.—All of this soil has been cleared and much of it is now used for crops, including corn, tobacco, small grains, lespedeza, and alfalfa. Little is either idle or used for pasture. It is a First-class soil,[5] although its productivity, workability, and conservability are a little lower than for a few other soils. It is well suited to a wide variety of crops, including truck crops and alfalfa. Moderately short rotations are suited, but care is required to avoid erosion. The more sloping parts will benefit from contour tillage and vigorous winter cover crops.

[4] "Medium" denotes optimum internal drainage for the production of commonly grown crops.

[5] See section on Use Suitability Groups for definitions of First-, Second-, Third-, Fourth-, and Fifth-class soils.

The soil is suited to truck crops and tobacco, but greater care is required to maintain productivity where these crops are grown. Legumes and grasses for hay and pasture are suited. If good stands of the more exacting legumes and grasses are to be maintained, however, relatively heavy fertilization must be practiced. Where good management is practiced, corn yields about 50 bushels, wheat about 22 bushels, and alfalfa about 2.9 tons an acre.

Greendale cherty silt loam, undulating phase (2–5% slopes) (GB).—This very cherty soil consists of colluvium and local alluvium washed from soils (mainly Clarksville and Fullerton) underlain by cherty dolomitic limestone. It differs from the undulating phase of Greendale silt loam chiefly in having enough chert throughout its entire depth to interfere materially with tillage. In addition, this soil is less extensive and is not so widely distributed throughout the cherty ridge lands. It is more commonly associated with Clarksville than with Fullerton soils.

Profile description:

0 to 10 inches, gray or brownish-gray silt loam containing much coarse gritty material and chert fragments, some as much as 6 inches in diameter.

10 to 20 inches, gray to yellowish-gray silt loam or silty clay loam containing much gritty material and many chert fragments.

20 to 40 inches, light brownish-yellow or grayish-yellow silty clay loam mottled with light-brown or light shades of gray; contains variable amounts of grit and chert fragments.

Chert beds may be in the lower part of the soil, and dolomitic limestone bedrock is at widely variable depths ranging from 8 to 25 feet.

The natural fertility and organic-matter content are low and the reaction is medium to strongly acid. Internal drainage is medium to very rapid and the soil is easily permeable to both roots and moisture. The soil is moderate in capacity to hold moisture available to crops and is a little droughty where the content of chert is exceptionally high.

Use and management.—About three-fourths of this soil is cleared; the rest is under native deciduous forest, chiefly oaks. About 10 percent is used for crops. Corn and hay (mostly lespedeza, redtop, and orchard grass) are the chief crops. The rest of the cleared acreage is used for pasture. Little fertilization is practiced and little lime is applied. Under ordinary conditions corn yields about 22 bushels and lespedeza 1.0 ton or less an acre. Pastures are of relatively low quality; their carrying capacity does not exceed 75 cow-acre-days.

Chertiness, low fertility, and rather limited capacity for holding moisture available to plants restrict the usefulness of this soil for both tilled crops and pasture. The soil is low in productivity and rather difficult to work, but it is not particularly subject to loss of soil through runoff. Corn and hay are among the better suited crops; but if good yields are to be expected, heavy fertilization, adequate liming, and much organic matter are required.

Under a high level of management, corn should yield 45 bushels, lespedeza 1.7 tons, and tobacco 1,400 pounds an acre. The more desirable legumes and grasses can be maintained but good stands are more difficult to establish and hold than on many of the more fertile soils. Where adequate fertilization and liming, proper seeding, and control of weeds and brushy growth are practiced, pastures with a carrying capacity of about 105 cow-acre-days can be obtained.

Greendale cherty silt loam, rolling phase (5–12% slopes) (GA).—This soil differs from the undulating phase chiefly in having a stronger slope. It consists of very cherty colluvium and local alluvium washed chiefly from the associated Clarksville soils. The natural fertility and content of organic matter are low.

Use and management.—About 70 percent of the acreage is cleared; the rest is under deciduous forest, chiefly oaks. About 10 percent is used for crops, mainly corn, lespedeza, redtop, and orchard grass. The rest is used for pasture. Little fertilization is practiced and yields are low. The natural pasture plants are mainly lespedeza and broomsedge, with other volunteer vegetation. Their carrying capacity is about 70 cow-acre-days.

The soil is low in productivity and rather difficult to work but is not very susceptible to erosion. The very cherty nature, low fertility, and rather limited supplies of moisture held for plants restrict the usefulness of this soil for both tilled crops and pasture. Corn and hay are probably among the better suited crops. If they are to produce good yields, heavy fertilization, adequate liming, and much organic matter will be required. Under a high level of management, corn should yield 40 bushels and lespedeza 1.5 tons an acre.

The narrower strips occurring along drains within steeper areas of Clarksville and Fullerton soils are not well situated for cropping but are suitable for pasture. The more desirable legumes and grasses for pasture can be grown, although good stands are more difficult to maintain than on the more fertile soils. The droughtiness of much of the acreage limits the growth of pasture during dry periods. Nevertheless, where the fertility is brought to a high level and a good pasture cover is developed, the carrying capacity is about 100 cow-acre-days.

Gullied land, Armuchee and Litz soil materials (12–50% slopes) (GE).—This land type consists of areas of Armuchee, Litz, Dandridge, and Bland soils that have been reduced to a network of gullies by erosion. The areas range from a few acres to about 25 in size and are widely distributed throughout the Dandridge-Litz-Leadvale, the Sequoia-Litz-Dandridge, the Armuchee-Leadvale, and the Bland-Camp soil associations. The surface soil has been removed from most of the areas, and gullies of variable depth form an intricate pattern. The surface is too rough to allow the use of ordinary farm machinery and the prevailing relief is hilly or steep.

The exposed soil material in the Armuchee areas consists of yellowish-red firm silty clay. Much of the exposed material in the Dandridge areas is brownish-yellow friable shaly silty clay loam, and that in the Bland areas is weak-red firm silty clay. A few limestone ledges outcrop in the Armuchee and Bland areas, but the Dandridge and Litz areas are mostly free of hard rock outcrops, the bedrock being calcareous or soft weathered shale.

Use and management.—All this gullied land has been cleared and used for crops. Parts are now under volunteer pine forest or idle. An intermittent cover of sassafras, briers, and broomsedge is common to many of the idle areas but the cover on many parts is not sufficient to arrest erosion. A few areas may have an exceptionally good cover of kudzu, and here, as in the pine-covered areas, erosion is restrained and the soil is being slowly restored.

This land type is of little value except for forest. Shortleaf pine is well suited and can be expected to produce useful timber after growing 25 or 30 years. Kudzu is well suited to provide protection against erosion and is an economical means of rebuilding the areas for more desirable pasture plants. Some farmers may find it feasible to smooth these gullied areas and then establish fairly good pasture by heavy fertilization and careful seeding. This more rapid means of rebuilding the soil is more feasible in those areas that have milder slopes, shallow gullies, and no hard rock outcrops.

Gullied land, Fullerton and Talbott soil materials (12–50% slopes) (GF).—This land type consists of hilly and steep areas of Fullerton, Clarksville, Talbott, Dewey, and Decatur soils that have been greatly mutilated by erosion. The surface soil has been removed from a great part of the area, and gullies of variable depth form an intricate pattern. The surface is too rough for cultivation with ordinary farm machinery and the general relief is hilly and steep.

The tracts are widely distributed, chiefly in the Fullerton-Bolton-Clarksville soil association. This gullied land is much less common than Gullied land (Armuchee and Litz soil materials). Furthermore, its separate areas (2 to 10 acres) are smaller and less numerous because most of the soils from which it is derived are less subject to erosion than the Dandridge, Armuchee, Litz, Bland, and Sequoia soils.

The exposed soil material consists mostly of brownish-yellow to reddish-yellow firm cherty silty clay. The few areas of Dewey, Decatur, and Talbott soil material consist chiefly of red or yellowish-red firm to plastic silty clay. Most areas, except those of Talbott soil material, are free of bedrock outcrops. Where limestone bedrock outcrops are common, the gullies range in depth from less than 2 feet to 10 or 12 feet, and on the average are somewhat deeper than those common to Gullied land, Armuchee and Litz soil materials.

Use and management.—All of the acreage of Gullied land, Fullerton and Talbott soil materials, has been cleared and used for crops at some time. A small part is now under volunteer pine forest. A great part is idle and covered by sassafras, briers, and broomsedge. This cover in most places is not adequate to restrain erosion effectively. A few areas have a good cover of kudzu. In these and the pine-covered areas erosion is thoroughly restrained and the soil is slowly rebuilding.

This land type is of little value except for forest. Shortleaf pine is well suited and can be expected to produce useful timber after growing 25 or 30 years. Kudzu affords grazing and is well suited to provide protection against erosion. It is an economical means of rebuilding the areas for more desirable pasture plants.

It may be practical to construct check dams to stop further development of ditches and gullies. In places, diversion ditches along the upper edges of the areas will be useful in reducing runoff water passing through the gullied areas. Some farmers may find it feasible to smooth the less severely gullied parts and to establish fairly good pasture by heavy fertilization and careful seeding.

Gullied land, Sequoia and Montevallo soil materials (4–12% slopes) (GG).—This gullied land consists of areas of Sequoia, Jefferson, and Montevallo soils that have been mutilated by erosion. The separate areas are small but relatively numerous; most of them are in the Jefferson-Montevallo, the Montevallo, the Sequoia-Litz-Dandridge, and the Sequoia-Leadvale soil associations. Generally the surface soil has been removed from a great part of the areas and shallow gullies form an intricate pattern. The surface is too rough to be cultivated with ordinary farm machinery.

The exposed soil consists chiefly of brownish-yellow friable to firm shaly clay loam, although in many places it is predominantly variegated yellowish-brown and gray acid shale. There are few or no hard rock outcrops. Practically all of the surface soil has been removed; gullies are seldom more than 2 or 3 feet deep.

Use and management.—All of the acreage of this gullied land has been cleared and used for crops. Parts are now under volunteer pine forest but most of the land is idle and has an intermittent cover of sassafras, briers, and broomsedge that is not sufficient to stop erosion. In the few areas under kudzu or forested with pine, erosion is thoroughly restrained and the soil is being slowly restored.

This land type is of little value except for forest. Shortleaf pine is well suited and can be expected to produce useful timber after growing about 30 years. Kudzu affords some grazing and is effective against erosion. It provides an economical means of rebuilding the areas for more desirable pasture plants but growth will not be as luxuriant as on the more naturally fertile areas of Gullied land, Fullerton and Talbott soil materials; and Gullied land, Talbott and Decatur soil materials. It may be found feasible to construct check dams and diversion ditches. On some farms it may be practical to smooth off gullied areas with heavy tillage implements and establish fairly good pasture by heavy fertilization and careful seeding. In general, use of heavy tillage implements on this gullied land will be more feasible than on the more strongly sloping gullied lands because the gullies are generally shallow and runoff is not quite so active.

Gullied land, Talbott and Decatur soil materials (4–12% slopes) (GH).—This gullied land consists of former areas of Talbott, Decatur, and Dewy soils. The surface soil has been removed from a great part, and intricate gullies of moderate depth have formed. The areas are not numerous but are widely distributed in parts of the Stony land-Talbott and the Decatur-Dewey-Emory soil associations, more commonly in the Stony land-Talbott. The surface is too rough for ordinary farm machinery; the general relief is rolling.

The exposed soil material consists chiefly of red or yellowish-red firm to plastic silty clay. Bedrock outcrops are not common in areas associated with the Dewy and Decatur soils but are common in those associated with the Talbott.

Use and management.—All of this gullied land has been cleared and used for crops. A small part is under pine forest; a great part is idle. The idle areas are partly covered by sassafras, briers, and broomsedge or are bare. The plant cover generally is not adequate to stop erosion. A few areas may have a good cover of kudzu, and here, as in the pine-covered areas, erosion is restrained and the soil is being slowly remade.

This land type is of little value except for forest. Shortleaf pine is well suited. Kudzu provides some pasture and is an effective cover as well as an economical means of rebuilding areas for the production of such more desirable plants as bluegrass and white clover. It may grown or pasture established, organic matter will be of considerable value in producing high yields. The Cotaco soil can be improved by artificial drainage, especially for row crops. The feasibility of drainage will depend on a number of factors. Where management of this combination of soils is kept at a high level and drainage is adequate, corn should yield 52 bushels; lespedeza, 1.6 tons; and pasture, 140 cow-acre-days of grazing an acre.

Leadvale and Cotaco loams, rolling phases (7–16% slopes) (La).—This combination of soils differs from the undulating phases of Leadvale and Cotaco loams mainly in having stronger slopes. Some slopes reach gradients of 20 percent. The Leadvale soil occupies a larger proportion of this mapping unit than it does of undulating phases of Leadvale and Cotaco loams. Accordingly, the acreage is smaller in which drainage is notably impaired. The areas occur as narrow strips along drainageways in shale valleys in which Montevallo and Jefferson soils predominate.

Use and management.—Much of the area of these soils is cleared and used for hay, pasture, and corn. Lespedeza is the chief hay crop. Some pastures consist chiefly of lespedeza and others predominantly of broomsedge. Fertilization is practiced for corn, and lime has been applied to some areas.

These soils are suitable for tilled crops, but moderately low fertility, more rolling slopes, and somewhat impaired drainage limit the natural productivity and range of suitability. The stronger slopes require moderately long rotations if the soils are to be adequately conserved. The lime requirement is high, and additions of the usually deficient plant nutrients and organic matter are necessary if good yields are to be obtained. As with the undulating phases of Leadvale and Cotaco loams, the Cotaco soil areas have exceptionally good moisture relations for midsummer pastures. If adequately fertilized and seeded, the Cotaco areas have a carrying capacity of approximately 135-cow-acre-days. Under a high level of management these soils can be expected to yield 50 bushels of corn and 1.6 tons of lespedeza an acre.

Leadvale and Whitesburg silt loams, undulating phases (0–7% slopes) (Ld).—The soils of this combination lie as strips along drainageways in association with the soils developed from calcareous shale and interbedded acid shale and limestone. Their material was derived mainly from the Sequoia, Armuchee, Litz, and Dandridge series. These are among the more extensive of the soils developed on colluvium and are widely distributed throughout the Sequoia-Leadvale, Sequoia-Litz-Dandridge, Dandridge-Litz-Leadvale, and Armuchee-Leadvale soil associations.

The Whitesburg soil is derived from colluvium or local alluvium composed of materials originating chiefly in areas of calcareous shales. It predominates in areas immediately adjacent to the drainageways. There is no strong textural distinction between the surface and subsoil layers, and the reaction is less acid than that of the Leadvale soil. The surface 10 inches is brownish-gray silt loam. Below this and extending to about 18 inches is light-yellow silt loam or silty clay loam. Below 18 inches is mottled light-yellow and gray silty clay loam.

The Leadvale soil predominates in the higher areas more removed from the drainageways, although in places it is also directly adjacent. The surface 8 inches of the Leadvale soil ranges from grayish-yellow to gray silt loam. Below this and continuing to a depth of about 24 inches is yellow firm silty clay loam. The material below this depth is mottled yellow and gray firm but friable silty clay loam. Shale bedrock is at depths of 4 to 15 feet.

Internal drainage is slow, and during the wetter periods the water table is at or near the surface in areas adjacent to the drainageways. The soil material, however, is permeable to both roots and moisture. The natural fertility is moderate but the organic-matter content is rather low. The reaction ranges from moderately acid to slightly alkaline in the Whitesburg soil and from moderately to strongly acid in the Leadvale soil.

There are a few areas of this combination of soils that have good internal drainage, and here the surface soil is a little browner and the subsoil is free of mottlings to a depth of more than 30 inches. These areas can be expected to be somewhat more fertile and suited to a wider variety of crops than most of the others.

Use and management.—Most of this soil combination is cleared and used for hay and pasture. Some corn and small grains and a small amount of tobacco are grown. Lespedeza and redtop are the chief hay and pasture plants. Lime has been applied to much of the acreage. Corn and small grains receive moderate fertilization. Under ordinary conditions corn yields about 40 bushels and lespedeza about 1.1 tons an acre. Pasture has a carrying capacity of about 90 cow-acre-days.

These soils are well suited to many of the crops commonly grown. They are moderately productive, easily worked, and easily conserved. Their slow internal drainage, however, makes them poorly suited to such crops as alfalfa and restricts periods of cultivation. Where adequately fertilized and limed, they can be used intensively for row crops, as runoff is not an erosion hazard. Small grains and hay are among the best suited crops. Much of the acreage, especially of the Whitesburg soil, is desirable for pasture, since the moisture relations favor a long growing season. Relatively heavy fertilization and, on the Leadvale soil, adequate applications of lime, are necessary if relatively high yields are to be realized. Under good management corn will yield 55 bushels and lespedeza about 1.7 tons an acre. Where the fertility has been brought to a high level, the more desirable pasture plants such as orchard grass, bluegrass, white clover, and lespedeza provide about 145 cow-acre-days of grazing.

Leadvale and Whitesburg silt loams, rolling phases (5–12% slopes) (Lc).—These soils occur along drainageways in the Sequoia-Leadvale, Sequoia-Litz-Dandridge, Dandridge-Litz-Leadvale, and the Armuchee-Leadvale soil associations. They differ from the undulating phases of Leadvale and Whitesburg silt loams chiefly in having strong slopes. In general the proportion of Leadvale soil is greater in this combination of soils than in the undulating phases of Leadvale and Whitesburg silt loams. Internal drainage, though rather slow, is somewhat better than in the undulating phases. Only a small part of these rolling phases has a high water table during the wetter seasons.

Use and management.—Much of the acreage of these soils has been cleared and is used for small grains, hay, and pasture. A small amount is used for corn. Pasture and hay are not of high quality; they generally consist of lespedeza, broomsedge, and some redtop. Some areas have been limed, and some fertilization is practiced. The more remote areas—those in the hillier landscapes—do not receive much fertilization. Crop yields under ordinary conditions are not high.

These soils are well suited to many of the crops commonly grown; but chiefly because of the stronger slope, somewhat longer rotations are required and more care is necessary in controlling runoff than for the undulating phases of Leadvale and Whitesburg silt loams. Small grains and hay and pasture crops are best suited, although row crops such as corn and tobacco will produce well where the fertility and organic-matter content are maintained at high levels. Some areas may be suited to alfalfa, but those adjacent to the drains are generally too wet.

Limestone rockland, rolling and hilly (2–25% slopes) (LE).—This land type occupies gently sloping to hilly areas where limestone outcrops and loose rock cover a great part of the surface. Most of it is in the Stony land-Talbott soil association. There is a small amount of soil material that resembles Talbott and Colbert soils in texture and consistence, but it occupies less than 25 percent of the surface and ranges from only a few inches to 12 inches thick over bedrock. This soil material is fertile but so shallow to bedrock and limited in extent that it is of no value for crops that require tillage and of little value for pasture. Most of it supports a scrubby growth of cedars, oaks, and underbrush.

Limestone rockland, steep (25+% slopes) (LF).—This land type differs from Limestone rockland, rolling and hilly, chiefly in having stronger slopes. The gradient ranges up to 60 percent. Much of it occurs as bluffs along larger streams and around quarries. In a few places the slopes are precipitous, or clifflike. A great part of the surface is occupied by limestone outcrops and loose rock. There is a small amount of soil material in the interstices. The vegetation is predominantly cedars and scrubby deciduous trees, chiefly oaks, with a variable amount of brushy growth intermixed. This land is valueless for crops, pasture, or even forest cover. Trees are small and grow slowly.

Lindside silt loam (0–2% slopes) (LG).—This imperfectly drained soil on first bottoms is derived from mixed alluvium largely of limestone origin or strongly influenced by limestone. It is widely distributed over the county along a great many of the creeks (pl. 9, *B*) that flow through areas underlain by limestone or interbedded limestone and shale. Areas also occur along the Holston River. The surface is nearly level. Practically all areas are subject to flooding, although those along the Holston River are now partly protected by a flood-control dam upstream.

Profile description:

0 to 8 inches, brown or pale-brown silt loam.
8 to 20 inches, brown silt loam with some mottlings of gray and yellow.
20 inches+, mottled gray, yellow, and some brown heavy silt loam or silty clay loam; limestone or shale bedrock at widely variable depths—in places at less than 5 feet and in others as much as 35 or 40.

In places there is a dark-brown silt loam or silty clay loam layer at depths of 10 to 20 inches. It represents an older surface layer that has been buried by more recent floodwater deposits. A variable amount of chert occurs in a few places, but not enough to interfere materially with cultivation.

This is a fertile soil with a moderate content of organic matter. It ranges from moderately acid to slightly alkaline. Internal drainage fluctuates. The soil is sometimes flooded during the wettest season, but during the drier months the water table is about 3 feet below the surface. The soil is permeable to moisture and roots, although excessive moisture in the subsoil does not encourage root development of some of the deep-rooted plants. The high moisture-holding capacity for plants and the moderate depth to the water table during the drier seasons make this soil particularly favorable for midsummer pasture and for crops requiring abundant moisture late in summer and in fall.

Use and management.—A great part of this soil has been cleared. Some is used for permanent pasture, but a notable part is used for crops, chiefly corn and hay. On many areas corn is grown several years in succession. Little fertilization is practiced, since the occasional flooding aids greatly in maintaining relatively high fertility. Under ordinary conditions corn yields about 45 bushels an acre and pasture has a carrying capacity of about 115 cow-acre-days.

Lindside silt loam is suited to crops requiring tillage, but its range of suitability is limited by slow internal drainage and susceptibility to flooding. It is particularly well suited to permanent pasture, certain hay crops such as lespedeza, timothy, and redtop, and row crops such as corn and soybeans. It can be used intensively for row crops, as its natural fertility is high and runoff is no hazard.

Although this is a fertile soil, it will respond to proper fertilization, especially with phosphorus. In general, weed growth is rank on soils like this one, and adequate weed control will aid in obtaining high yields. Where additional acreage is needed for crops requiring better internal drainage, it may be feasible to improve some areas by artificial drainage.

Where high fertility and adequate drainage are maintained and weeds are eradicated, corn will yield 60 to 65 bushels and lespedeza about 2 tons an acre. Because of high fertility and particularly favorable moisture relations, this soil provides pasture of high quality over a long grazing season. The carrying capacity under good management, which particularly includes adequate fertilization and suppression of weedy and brushy growth, should be about 150 cow-acre-days.

Made land (0–15% slopes) (MA).—This land type occupies areas that have been altered by man-made excavations or depositions and have no agricultural value. It includes fills, dumps, and such excavations as quarries and mines. Some of these areas are in railroad yards and a few are athletic fields. They are rather widely scattered over the county, but most of them are in the vicinity of Knoxville and Mascot. Those in the vicinity of Mascot consist chiefly of refuse from zinc mines.

Melvin silt loam (0–2% slopes) (MB).—This very poorly drained soil on first bottoms was derived from mixed general alluvium. The parent rock for this alluvium apparently was predominantly limestone

Use and management.—Practically all of this soil is forested. It occupies areas that have never been cleared and cultivated and therefore has not been subjected to erosion. The soil is fairly well suited to cultivated crops. It is moderately productive and not particularly hard to work. The slow percolation and moderately strong slope are conducive to erosion, however, especially on tilled areas. Since it is susceptible to erosion, the soil needs long rotations that include close-growing small grains and grasses and legumes for hay and pasture. Where feasible, field work should be done on the contour. Subsoiling and strip cropping may also be practical ways of restricting erosion. Adequate applications of fertilizer, organic matter, and lime are required if yields are to be kept high. Under good management corn will yield 38 bushels and alfalfa about 2.8 tons an acre. Under favorable conditions the carrying capacity of well-established pasture will be about 100 cow-acre-days.

Sequoia silty clay loam, eroded rolling phase (5–12% slopes) (Sr).—This soil differs from Sequoia silt loam, undulating phase, chiefly in its stronger slope and its loss of a considerable part of the original surface soil through erosion. It is one of the most extensive of the Sequoia soils and occupies much of the Sequoia-Leadvale soil association (pl. 11, *B*). A considerable acreage is also in the Sequoia-Litz-Dandridge and the Dandridge-Litz-Leadvale associations. The separate areas range from 10 to 60 acres in size.

The plow layer consists of a mixture of the original surface soil with some subsoil material; ordinarily it is a brownish-yellow silty clay loam. In spots practically all the surface soil has been lost and the plow layer consists of reddish-yellow very firm silty clay. The surface is rolling but small smoother areas are included.

The natural fertility is medium, and the content of organic matter is low. The reaction is medium to strongly acid. Internal drainage is somewhat impaired to slow, and percolation of moisture is greatly retarded by the firm subsoil. Roots, however, can penetrate the soil material to shale bedrock.

Use and management.—All of this soil has been cleared and used for crops at some time but a small part is now idle. Corn, small grains, and lespedeza hay are the chief crops. Small acreages of alfalfa, tobacco, soybeans, and vegetables are grown. Rather short rotations are in common use, and some fertilization is practiced for most crops. Organic matter is not usually added either through application of manure or the turning under of winter legume crops. Alfalfa and tobacco ordinarily are rather heavily fertilized; a great part of the acreage receives 2 to 3 tons of lime an acre every 6 to 10 years. Under ordinary conditions corn yields about 20 bushels, wheat 10 bushels, and lespedeza 0.7 ton an acre. Pasture is not of high quality and ordinarily produces 40 cow-acre-days of grazing.

This soil is considered suitable for both tilled crops and pasture, but its management requirements are somewhat exacting. Fertility should be kept at a high level, and moderately long rotations consisting chiefly of fall-sown small grains and grasses and legumes for hay and pasture are a necessary part of good management. The rather strong slope and the slow permeability of the subsoil cause runoff to be hazardous where the soil is not well protected by vegetation. Strip cropping and subsoiling may be practical means of restraining erosion.

Areas not required for crops can be brought to a fairly high state of fertility for pasture. Where high fertility and good tilth are established and maintained and erosion is adequately checked, corn will yield 35 bushels and alfalfa about 2.5 tons an acre. Under such conditions the more desirable pasture grasses and legumes maintain a good cover and produce about 85 cow-acre-days of grazing.

Sequoia silty clay loam, severely eroded rolling phase (5–12% slopes) (Sr).—This phase consists of areas of Sequoia silt loam that have a rolling surface and are so eroded that practically all of the surface soil has been lost. Shallow gullies are common, and some gullies are too large to be obliterated by tillage. The separate areas of this fairly extensive soil are 5 to 40 acres in size and are widely scattered throughout the Sequoia-Leadvale, Sequoia-Litz-Dandridge, and Dandridge-Litz-Leadvale soil associations. Although the predominant slope range is 5 to 12 percent, small tracts on ridge crests have a smoother surface.

The plow layer consists chiefly of reddish-yellow very firm silty clay loam or silty clay. Shale bedrock is at depths of ½ to 1½ feet, but there are places on the more exposed slopes where shale practically outcrops and a few where thin limestone beds outcrop. In some areas the subsoil is more nearly brownish yellow, quite plastic, and similar to that of Colbert silty clay. Because of their small size and close association with Sequoia soils, these Colbert areas were included with this Sequoia soil in mapping.

The natural fertility and content of organic matter are very low for Sequoia silty clay loam, severely eroded rolling phase. The clayey plow layer makes permeability to moisture very slow and causes the soil to puddle easily when wet and to become hard quickly as it dries. The reaction is medium to strongly acid.

Use and management.—All of the acreage has been cleared and cropped at some time. A great part is now idle or used as unimproved pasture. The growth on these areas consists chiefly of sassafras, briers, and broomsedge, with some lespedeza and other grasses intermixed. Small acreages have been improved for pasture or are used for crops, chiefly small grains, hay, and corn. Management on much of the acreage is not at a high level. Erosion is active and yields are usually low.

The rolling surface, low fertility, and slow permeability make this soil rather poorly suited to tilled crops, but it is fairly well suited to pasture if fertility is built to a high level and desirable pasture plants are established. The carrying capacity, however, even under the most favorable conditions, is limited by its droughtiness. Those areas needed for crops generally require organic matter, lime, and plant nutrients. If the soil is to be maintained under cropping, exceptionally long rotations consisting chiefly of fall-sown small grains and grasses and legumes are necessary. Under the most favorable conditions corn should yield about 20 bushels and lespedeza 0.8 ton an acre. The carrying capacity of pasture will be about 50 cow-acre-days under favorable management, but most of the grazing will be confined to the moister parts of the growing season.

Sequoia-Bland silty clay loams, eroded undulating phases (2–5% slopes) (Sp).—In this complex are areas of Sequoia and Bland soils so small and thoroughly intermingled that they could not be decultivation. Steep slope, shallow depth to bedrock, and low natural fertility limit the suitability of the Muskingum-Lehew areas chiefly to forest.

JEFFERSON-MONTEVALLO SOIL ASSOCIATION

The Jefferson-Montevallo soil association (pl. 14, *A*) occupies valley positions. The underlying rock is predominantly acid shale. Practically all of the areas lie as undulating to rolling strips adjacent to areas of the Muskingum-Lehew soil association. A few steeper narrow strips and a notable acreage of gently sloping or nearly level colluvial soils, chiefly of the Leadvale and Cotaco series, occur along the drains. Jefferson soils predominate on the parts adjacent to the Muskingum-Lehew ridges, and the Montevallo elsewhere.

The soils of this association (pl. 14, *B*) are generally low in fertility, strongly acid, and, except for the soils on alluvium and colluvium, shallow to shale bedrock. A large part has been cleared and cropped, and as a result most of the upland soils have been moderately to severely eroded. In many places erosion has been so great that the soil will be unsuited for either crops or pasture until extensive measures are taken to fill in the gullies, increase the fertility, and establish a good grass cover. Third- and Fourth-class soils predominate, although Fifth-class soils are common in places. There is a small acreage of Second-class soils.

Farming for production of crops used by the farm family prevails in the less productive parts, and idle land is common. Corn and pasture occupy much of the acreage in such sections, and crop yields and the carrying capacity of pasture are low. In the more productive parts a more general type of farming is practiced, and on a few farms where good management prevails fairly high yields of corn, small grains, hay, and pasture are produced. A large part of the acreage is suited to general farming. In order to establish and maintain a relatively high level of production, however, particularly good management is required, chiefly because the more extensive soils are prevailingly of low fertility and greatly susceptible to erosion.

CUMBERLAND-HUNTINGTON SOIL ASSOCIATION

The Cumberland-Huntington soil association consists of bottom lands and associated high stream terraces along the Holston, French Broad, Tennessee, and Clinch Rivers. Most areas are in the meanders of these streams and are from a fraction of a square mile to about 1½ square miles in size. The separate areas generally consist of an irregular strip or belt of nearly level bottom land adjacent to the river channel and a higher, somewhat broader area of undulating and rolling stream terraces.

Huntington, Staser, and Lindside soils occupy most of the bottom lands along the Holston, Tennessee, and Clinch Rivers. Undulating and rolling Cumberland, Etowah, and Waynesboro soils predominate on the stream terraces, which are hilly in small areas but on the whole are fairly smooth.

The soils on the bottom lands are fertile, easily worked, and moderately drained to well drained. They were originally subject to periodic flooding, but flooding is much less frequent now that dams have been built upstream. The soils on the stream terraces are moderate to high in fertility and in great part are well drained. There are sufficient cobbles in places to interfere materially with cultivation.

First- and Second-class soils predominate on the bottom lands, and Second-class soils on the terraces. A great part of the acreage in this association has been cleared and is used mainly for crops. Parts of the cleared areas on the terraces are used for pasture grown in rotation with other crops. Much of the bottom land is used intensively for row crops, chiefly corn, although some hay and truck crops are also grown. Rotations are more common on the terraces where corn, small grains, hay, and some truck crops and tobacco are grown. General livestock farming, supplemented by a cash crop, usually tobacco, prevails.

This association is one of the most productive of the county, and crop yields are relatively high. The fertility, especially of the bottom lands, is easily maintained, and the soils of the terraces are well suited to a variety of crops without especially exacting management. Soils on the bottom lands are suited to intensive row cropping and to general livestock farming supplemented by a limited acreage of cash crops.

DECATUR-DEWEY-EMORY SOIL ASSOCIATION

The Decatur-Dewey-Emory soil association occupies irregular valley areas overlying relatively high grade limestone. It mainly occurs adjacent to areas of the Fullerton-Bolton-Clarksville soil association. The surface is predominantly undulating to rolling, and internal drainage of practically all of the soils is moderately good to very good. A large part is occupied by very fertile smooth soils that are at least moderately deep to bedrock. The soils are considered to be strong, and high fertility is not difficult to maintain. First- and Second-class soils predominate, but on the more sloping parts careful attention is required in controlling erosion.

Most of the acreage has been cleared and is used mainly for crops or pasture. General livestock farming prevails; corn, small grains, and legume hay and pasture crops are grown. Some of the most productive farms have a part or all of their acreage in this association, which includes some of the most productive parts of the county. The areas are well suited to livestock farming. They are naturally productive of legumes and grasses, although some liming and fertilization are required to maintain high fertility. Many of the uneroded soils in this association are productive of truck crops, whereas most of the eroded soils are not suited to truck crops because of their poor tilth.

SEQUOIA-LITZ-DANDRIDGE SOIL ASSOCIATION

The Sequoia-Litz-Dandridge soil association (pl. 15, *A*) consists predominantly of soils developed over interbedded shale and limestone and calcareous shale, which have been weathered to widely variable depths. The association is undulating to hilly and occupies valley positions. It consists of low hills with moderately broad smooth crests and moderately strong slopes, and of narrow strips of imperfectly drained soils on local alluvium along the drains. Sequoia soils are on most of the smooth hill tops and make up about 60 percent of the acreage. Litz and Dandridge soils predominate on the strong slopes, and Leadvale, Whitesburg, and Lindside soils occupy the alluvial strips.

Internal drainage is moderately slow to medium; surface runoff is medium to very rapid. The general fertility ranges from low to medium for the Sequoia, Litz, and Dandridge soils, and from medium to high for the Leadvale and Lindside soils.

Third-, Fourth-, and Fifth-class soils predominate, although the Lindside and some of the Leadvale and Sequoia soils are of the Second class. General farming predominates; corn, wheat, oats, and hay are the chief crops. A great part of this association has been cleared and cropped, but a considerable acreage in the more sloping areas has been severely eroded and greatly lowered in productivity. Much of this eroded acreage is now either idle or used as unimproved pasture.

Strong slope, shallow depth to bedrock, and generally eroded condition make especially careful management necessary if the productivity of the soils in this association is to be built up and maintained. The smoother, less eroded areas are moderately productive of most farm crops and pasture when farmed under a good system of management. The other areas can be made to produce good grazing. A system of farming that maintains a large acreage of pasture and hay crops on the more sloping parts is well suited. Moderately long rotations consisting of hay, small grains, and infrequent row crops are satisfactory on the smoother less eroded Sequoia soils. The Leadvale, Whitesburg, and Lindside soils are suited to intensive use, providing their fertility is maintained. The Litz, Dandridge, and the severely eroded Sequoia soils are not well suited to crops requiring tillage. This association generally is much less desirable for truck crops than some of the other associations in which deeper, more friable, smooth soils are common.

DANDRIDGE-LITZ-LEADVALE SOIL ASSOCIATION

The Dandridge-Litz-Leadvale soil association differs from the Sequoia-Litz-Dandridge association chiefly in having stronger slopes, prevailingly hilly and steep. It occupies moderately large areas in the northern and eastern parts of the county. Dandridge and Litz soils are much more extensive than Sequoia soils. The average depth to bedrock is notably shallow, and surface runoff on much of the acreage is very rapid. Internal drainage is adequate, but the capacity for holding moisture is limited.

Possibly 35 percent of the acreage has been cleared, and much of the upland has been greatly damaged by erosion. Fourth- and Fifth-class soils prevail on the uplands. Corn, hay, and pasture are the main crops of this association. Much of the acreage now lies idle or has been abandoned to volunteer forest. On some areas farming for home use prevails; on others, livestock farming. Soils well suited to crops requiring tillage are limited chiefly to the narrow strips of bottom land along the streams and drainageways.

Much of this association is not well suited to intensive use, mainly because of strong slope, relatively shallow depth to bedrock, and, in places, severe erosion. If properly fertilized, much of the upland is well suited to pasture and, accordingly, well suited to livestock farming in which long rotations consisting principally of legume hay and pasture crops are used. The more limited but significant and widely distributed soils on the nearly level valley floors are well suited to intensive farming. Practically every farm in this association has some acreage on these smooth alluvial soils.

TELLICO-NEUBERT SOIL ASSOCIATION

The Tellico-Neubert soil association occupies a predominantly hilly to steep landscape in which Tellico soils are the most extensive. A smaller but significant acreage of Neubert and Hamblen soils is on the colluvial slopes and along the drainageways and creeks. The soils generally are a reddish loam that is moderately fertile and permeable. The steeper parts are shallow to bedrock, and those less steep are moderately deep.

Fourth- and Fifth-class soils predominate in this association; but on the ridge tops, most of which are narrow, and on the bottom lands and colluvial slopes Second- and Third-class soils prevail. A large part of the acreage suitable for crops has been cleared. The steepest slopes are not well suited to either crops or pasture and are largely under forest. Some hilly and steep areas once cropped are now under reestablished pine forest. In most parts of the association, forest occupies much of the land.

Farms usually consist mostly of forested areas; the cropland is confined to the broader ridge tops, colluvial slopes, and bottom lands. General farming and truck crop production prevail. The smoother Tellico and Neubert soils are favored, especially for early market vegetables. Some of the hilly slopes are used for pastures that provide good grazing when properly fertilized and protected from erosion.

ARMUCHEE-LEADVALE SOIL ASSOCIATION

The Armuchee-Leadvale soil association is predominantly hilly and steep and shallow to shale and limestone bedrock. It occurs as an irregular belt in the northern part of the county. There are narrow strips of smooth Leadvale soils along the drains, and some rolling areas of Sequoia soils, moderately deep to bedrock, on the ridge tops. Nevertheless, the shallow hilly and steep Armuchee soils greatly predominate.

Probably two-thirds of the association has been cleared, and much of the cleared hilly and steep part has been severely eroded. Some of this has grown up in pine forest.

This association is not well suited to systems of farming in which tillage of a large part of the farm is required. Much of it is not suited to crops, except those grown in very long rotations, but is capable of producing good quality pastures. Bluegrass and white clover grow well where the natural fertility has been replenished or has not been greatly reduced. The steepest and most severely eroded areas cannot be expected to be especially useful as pasture and are suited chiefly to forest. Crops grown in moderate to short rotations are confined mainly to the smooth strips along the drains and creeks.

STASER-HAMBLEN SOIL ASSOCIATION

The Staser-Hamblen soil association occupies the first bottoms along Bullrun Creek, which is in the northern part of the county. Hamblen soils predominate, but Staser soils and soils of low stream terraces occupy a smaller part. In most places the soils are nearly level, of moderate to high fertility, and not especially acid. Practically all the acreage is subject to periodic flooding. This association usually makes up a part of farms that lie in adjacent associations, chiefly the Armuchee-Leadvale. Because the Armuchee-Leadvale does not have a large acreage of soils suited to crops, a great part of the cropped acreage on the farms is within the Staser-Hamblen association.

A large part has been cleared and is used rather intensively for crops on farms producing general livestock. Corn occupies an extensive acreage, and hay, pasture, and some small grains the rest. Yields are moderate under usual conditions but very high under good management.

The soils of this association are not difficult to maintain at a fairly high level of fertility. The workability is good, except where affected by flooding, and erosion is not serious. A small acreage may be damaged by deposits of unproductive sand or clayey subsoil material carried from actively eroding areas in the adjacent upland.

BLAND-CAMP SOIL ASSOCIATION

The Bland-Camp is one of the less extensive soil associations. It occurs in a strongly dissected belt in the eastern part of the county. This belt consists mainly of the hilly and steep dusky red Bland soils but has narrow areas of rolling Bland soils on the ridges and narrow strips of Camp soils along the draws. These soils have moderate natural fertility but their rather slow permeability and predominantly strong slopes promote rapid erosion when the soil is tilled.

A considerable part of the steep and some of the hilly areas are under cut-over native forest. Much of the Camp, as well as smaller but notable parts of the hilly and steep Bland soils, have been cleared. A large part of the hilly and steep and some of the rolling Bland soils have been abandoned as crop land after being severely eroded and have grown up in shortleaf and Virginia pines.

Much of this association is not well adapted to farming, although the Camp and the rolling Bland soils are suited to crops. The size of the suitable areas is small, as they are closely flanked by extensive hilly and steep areas of limited value for pasture or forest.

SEQUOIA-LEADVALE SOIL ASSOCIATION

The Sequoia-Leadvale soil association occupies predominantly undulating to rolling valley positions over calcareous shale and interbedded shale and limestone. On the smoother parts of the low ridges the depth to bedrock is 2 to 3½ feet, but on the more exposed slopes it is less. The alluvial soils along the drains occupy an appreciable acreage and are more than 3 feet deep to bedrock. A great part of the upland has ~~been eroded~~. Many of the more sloping areas now have a plow layer consisting of clayey subsoil material. There is also an extent of gullied land on areas that were cultivated without adequate control of runoff.

A great part of this association has been cleared (pl. 15, *B*) and much is now used for general livestock farming. Corn, small grains, and legume and grass hay and pasture crops predominate. In some places a notable acreage lies idle; its productivity has been greatly reduced by erosion losses.

The soils of this association generally are subject to serious erosion when cultivated and are not among the most fertile in the county. Nevertheless, they are suited to general farming in which livestock production is important. Second- and Third-class soils predominate; Fourth- and Fifth-class soils occupy the more sloping eroded parts. The smoother parts of the upland, chiefly Sequoia soils, are suitable for crops if moderately long rotations are used and adequate fertilization is practiced. The alluvial soils along the streams and drains are well suited to intensive use but will require fertilization to keep yields high. Most of the soils are capable of producing good pasture under proper management.

SEQUOIA-BLAND SOIL ASSOCIATION

The Sequoia-Bland soil association (pl. 16, *A*), like the Sequoia-Leadvale, occupies undulating to rolling valley positions. It consists of an intricate pattern of Bland and Sequoia soils with strips of Leadvale and Lindside soils along the drains. The soils are shallow to interbedded shale and dusky red argillaceous limestone bedrock. The range in slope is a little greater than for the Sequoia-Leadvale association and an appreciable part is hilly or strongly sloping.

A great part has been cleared and was frequently cropped in the past (pl. 16, *B*). Erosion has been active on much of it. General livestock farming is now practiced and appears to be well suited. Corn, hay, small grains, and pasture are important crops. The upland part is not high in productivity because it is eroded and gullied. The limited acreage of soils on local alluvium is of moderate productivity and is suited to such crops as corn and grasses and legumes for hay and pasture. Third- and Fourth-class soils predominate on the upland, and Second-class soils on most of the bottom land.

MONTEVALLO SOIL ASSOCIATION

The Montevallo soil association is relatively small. Most of it lies as an irregular narrow strip southeast of Bullrun Creek and parallel to it. It consists predominantly of rolling and hilly Montevallo soils with small colluvial strips along the drains. With the exception of these colluvial areas, the soils are shallow to very shallow to acid shale bedrock. They are low in fertility, medium to strongly acid, and very limited in capacity for holding moisture available to crops. Much of the smoother part has been cleared and cropped at some time but is now largely abandoned or idle. A notable acreage has been very severely eroded and is now in shortleaf and Virginia pines. Parts of the hilly areas are still under native forest.

A great part of this association is poorly suited to crops or pasture. The smoother areas possibly can be made to produce sufficient pasture, though much of the acreage should be returned to forest. The limited areas of colluvial soils are suited to crops, but the strips are so narrow and small that they do not form a farm unit and are not conveniently located to become a part of a farm unit that lies predominantly in another soil association.

TABLE 7.—*Soil series of Knox County, Tenn., classified by soil orders and great soil groups, and factors that have contributed to differences in soil morphology*[1]

Great soil group and series	Relief	Parent material	Time[2]
ZONAL			
Red-Yellow Podzolic:			
Red members:		Residium weathered from—	
Decatur	Undulating to hilly	High grade limestone	Long.
Dewey	Undulating to steep	do	Do.
Bolton	Rolling to steep	Arenaceous limestone or limestone with sandy beds.	Do.
Fullerton	Undulating to steep	Moderately cherty limestone	Do.
Talbott	Undulating to hilly	Moderately argillaceous limestone	Do.
Farragut	do	High grade limestone over shale	Do.
Sequoia[3]	do	Interbedded shale and limestone and calcareous shale.	Do.
		Mixed general alluvium strongly influenced by—	
Cumberland	do	Limestone	Do.
Etowah	do	do	Medium.
Waynesboro	do	Shale, sandstone, and limestone	Long.
Nolichucky	Rolling	do	Do.
		Local alluvium chiefly from—	
Alcoa	Undulating to rolling	Tellico soils	Medium to long.
		Residuum weathered from—	
Bland[4]	Rolling to steep	Dusky-red shaly limestone	Short to long.
Tellico[4]	do	Calcareous sandstone	Do.
Yellow members:			
Clarksville	do	Cherty limestone	Long.
		Mixed general alluvium derived largely from—	
Sequatchie	Undulating to rolling	Sandy rocks	Medium.
		Colluvium and local alluvium chiefly from—	
Jefferson	do	Muskingum and Lehew soils	Medium to long.
Leadvale	do	Dandridge, Armuchee, Sequoia, Litz, Montevallo, Muskingum, and Lehew soils.	Long.
		Residuum weathered from—	
Colbert[4]	Undulating to hilly	Argillaceous limestone	Short to long.
INTRAZONAL			
Planosols:		Mixed alluvium strongly influenced by—	
Wolftever	Undulating to rolling	Limestone, shale, and sandstone	Long.
Guthrie[5]	Nearly level	Chiefly limestone	Very long.
Tyler	do	Chiefly shale	Do.
AZONAL			
Alluvial soils:		General alluvium strongly influenced by—	
Huntington	Nearly level	High grade limestone	Very short.
Roane	do	Cherty limestone	Do.
Lindside	do	Limestone	Do.
Congaree	Nearly level to very gently undulating.	Micaceous rocks	Do.
Chewacla	Nearly level	do	Do.
Staser	Nearly level to very gently undulating.	Chiefly shale	Do.
Hamblen	Nearly level	do	Do.
		Local alluvium chiefly from—	
Emory	Undulating to rolling	Decatur, Dewey, and Farragut soils	Very short to long.
Greendale	do	Fullerton and Clarksville soils	Do.
Camp	Gently sloping to sloping	Bland soils	Do.
Abernathy	Nearly level	Chiefly Decatur, Dewey, and Farragut soils	Very short.
Ooltewah	do	do	Do.
Whitesburg	Undulating to rolling	Dandridge, Armuchee, Litz, and Sequoia soils.	Do.
Cotaco	do	Muskingum, Lehew, and Jefferson soils	Do.
Neubert	do	Tellico soils	Do.
Melvin[6]	Nearly level	Limestone	Short.
Prader[6]	do	Shale	Do.

See footnotes at end of table.

TABLE 7.—*Soil series of Knox County, Tenn., classified by soil orders and great soil groups, and factors that have contributed to differences in soil morphology*[1]—Continued

AZONAL—Continued[6]

Great soil group and series	Relief	Parent material	Time[2]
Lithosols:		Residuum weathered from—	
Armuchee	Hilly to steep	Interbedded limestone and shale	Medium to very short.
Dandridge	do	Calcareous shale	Do.
Litz	do	Leached shale	Do.
Montevallo	Undulating to steep	Acid shale	Short to very short.
Muskingum	Hilly to steep	Chiefly sandstone	Medium to very short.
Lehew	do	Dusky-red sandy shale	Do.

[1] Inasmuch as climate and vegetation are relatively uniform over the county, they cannot account for the broad differences in the soils.
[2] The length of time that the material has been in place as indicated by the degree of profile development.
[3] The Sequoia profile is partly within the range of the Red members and partly within that of the Yellow members.
[4] These soils are relatively shallow to bedrock, have weakly differentiated or thin B horizons, and are considered, therefore, to be intermediate between zonal soils and the azonal Lithosols. They are frequently described as being lithosolic.
[5] Some of the Guthrie soil as mapped in Knox County classifies as alluvial soil with gley horizon.
[6] These soils have gley horizons. Under recent refinements in classification, they would be classed as Low Humic Gley soils.

MORPHOLOGY OF SOILS REPRESENTING THE GREAT SOIL GROUPS

RED-YELLOW PODZOLIC SOILS

RED MEMBERS

The red members of the Red-Yellow Podzolic great soil group (*16*) are zonal soils having thin organic and organic-mineral layers over a yellowish-brown leached layer which rests upon an illuvial red horizon. They developed under a deciduous or mixed forest in a warm-temperate moist climate. The soil-forming processes involved in their development are laterization and podzolization. The red members in Knox County are listed in table 7.

These soils apparently have all developed under relatively similar conditions of climate and vegetation. They are well drained, and although they range somewhat in degree of maturity, all are old enough to have at least a moderately well developed Red-Yellow Podzolic soil profile. They range from undulating to steep. Profile differences are probably not caused primarily by variance in slope gradient. Many profile differences can be correlated with marked differences among parent materials.

Decatur series

The soils of the Decatur series have thick solums and have developed from high grade limestone on undulating to steep areas in the uplands. They have few rock outcrops except in severely eroded places. Since they are among the most productive and well-developed soils in the county, they probably supported some of the most luxuriant vegetation. As a natural result they have a darker A horizon than any of the other well-developed soils—an indication of a higher content of organic matter. The luxuriant vegetative growth also tended to inhibit erosion and to develop a friable surface soil and subsoil.

A typical Decatur profile follows:

A_1 0 to 12 inches, dark-brown to dark reddish-brown (7.5YR 3/2 to 5YR 3/2)[16] friable heavy silt loam with a moderately well-developed medium crumb structure.

B_1 10 to 18 inches, yellowish-red (5YR 4/6) to reddish-brown friable silty clay loam with a weakly developed fine to medium blocky structure.

B_2 18 to 42 inches, red (2.5YR 4/6) or dark-red plastic silty clay with a well-developed medium to coarse blocky structure; structure faces glossy and darker than the crushed material; many dark-gray to black concretions, usually less than one-fourth inch in diameter.

B_3 42 to 70 inches, reddish-brown or yellowish-red firm to plastic silty clay; structural particles larger and less distinct than in layer above; a few weathered, soft, powdery chert fragments.

C 70 to 90 inches +, reddish-brown or yellowish-brown firm to plastic silty clay or clay lightly splotched and streaked with red, brown, yellow, and gray; bedrock at 12 to 30 feet in most places.

Dewey series

The soils of the Dewey series developed from high grade limestone, apparently higher in insoluble impurities, particularly silica, than the rocks underlying the Decatur soils. They are generally somewhat

[16] Soil color names are those adopted by the 1948 Committee; symbols following names are Munsell color notations.

Farragut series

The Farragut soils have developed from materials weathered from a thin bed of limestone over shale. The parent materials differ from those of Sequoia soils in having a higher proportion of limestone, and from the Decatur soils in having a shaly substratum at depths ranging from 18 to 48 inches. Farragut soils essentially consist of a shallow Decaturlike solum resting on disintegrated acid shale. They occupy valley positions similar to those of the Decatur and many areas of the Sequoia soils. They are fertile and medium to strongly acid. The predominant slope range is undulating to rolling. The native vegetation was predominantly oaks, hickories, and associated deciduous hardwoods.

A representative profile of Farragut soil (silt loam) is as follows:

0 to 8 inches, brown (7.5YR 4/2, dry) or dark reddish-brown (5YR 3/3, moist) friable silt loam; lower part may be lighter brown and finer textured; under virgin conditions layers may be 10 to 12 inches thick, with the surface 2 inches darker and of higher organic content.
8 to 12 inches, gradation from brown to reddish-brown friable silty clay loam; moderately developed firm blocky structure.
12 to 20 inches, reddish-brown (5YR 4/4 to 4/6) firm plastic silty clay; in places may be more nearly yellowish brown.
20 to 40 inches, yellowish-brown to yellowish-red (5YR 4/8 to 7.5YR 5/8) firm plastic silty clay with some reddish and gray mottles and some dark concretions; lighter brown with depth; thickness varies greatly; underlying soft variegated brownish-yellow and gray shaly material is at depths ranging from 18 to 48 inches.

Sequoia series

The Sequoia soils have developed from the weathered products of interbedded shale and limestone and from calcareous shale. The parent material contains less limestone than that of the Farragut soils but more than that of the Montevallo and Litz soils. This difference in parent material is apparently the cause of the differences among these series. The Sequoia soils have parent material similar to that of the Armuchee soils, but differ from them in occupying milder relief and are therefore subject to slower geologic erosion. As a result they have developed zonal profiles, whereas the Armuchee soils have developed only azonal profiles.

The Sequoia soils, compared with soils such as the Fullerton, Clarksville and Dewey, are shallow to bedrock but have relatively strong textural and structural zonal profile characteristics. That is, the illuviated layer of the Sequoia has a decidedly finer texture and a relatively strong moderate blocky structure in contrast to the silt loam texture and weak crumb or granular structure of the eluviated layer. The Sequoia soils are moderate in fertility, moderately well drained internally, and medium to strongly acid.

A representative profile of a Sequoia silt loam follows:

0 to 8 inches, very pale-brown (dry) or light yellowish-brown to yellow (moist) friable silt loam with a weak fine granular structure; under virgin conditions surface inch darker (10 YR 6/4 to 7/6).
8 to 14 inches, reddish-yellow (7.5YR 6/8) firm silty clay loam with moderate to well-developed blocky structure.

14 to 22 inches, reddish-yellow (7.5YR 5/8) to strong brown very firm plastic, somewhat waxy (compact when dry) silty clay that has a moderate to well-developed medium blocky structure; may contain small dark concretions and in the lower part some partially weathered shale fragments.
22 inches +, mottled yellow, red, and gray very firm plastic silty clay.

Shale is at depths of 18 to 42 inches. In many places, to a depth of several feet, it is soft, evidently leached, calcareous shale. In other places calcareous shale is within 6 or 8 inches of the lower edge of the solum. In some landscapes there are limestone interbeds in the shale.

Cumberland series

The Cumberland soils are well developed red members of the Red-Yellow Podzolic soils. They formed from high-lying very old deposits of mixed alluvium strongly influenced by limestone. The predominate slope is undulating to rolling, although an appreciable part is hilly. The relatively high fertility of these soils, together with favorable moisture conditions, appears to have supported a heavy forest growth that left a relatively high content of organic matter in the upper layer. The Cumberland resemble the Decatur soils in many properties but are generally deeper and more friable and have some cobbles and pebbles in the profile. Commonly an irregular gravelly bed is directly above the underlying sedentary material. These soils are medium to strongly acid throughout.

A representative profile follows:

0 to 8 inches, brown (7.5YR 5/4 to 4/4) mellow silt loam; under virgin conditions has a thickness of 12 inches, a decidedly darker surface 2 inches, and much organic matter.
8 to 16 inches, yellowish-red (5YR 4/8) friable silty clay loam.
16 to 40 inches, red to dark-red (2.5YR 4/6 to 3/6) firm but somewhat friable silty clay with a weakly developed medium blocky structure.
40 inches +, yellowish-red firm but moderately friable silty clay or silty clay loam that may have yellow and gray reticulations.

A small quantity of quartzite pebbles occurs throughout the soil, and in places quartzite cobbles are abundant. In many places a gravelly bed, varying in thickness and amount and size of gravel, is below this layer. The sedentary, or underlying, bedrock is at depths of 4 to 20 feet. In general the shallower depths to bedrock occur on the more sloping parts.

Etowah series

The soils of the Etowah series consist of materials comparable to those of the Cumberland soils. The chief difference is that the Etowah soils are somewhat younger in profile development. They are generally on lower stream terraces and have a smoother relief, a lighter red color throughout the profile, and a more friable subsoil. Areas of Etowah and Cumberland soils along the French Broad River contain a noticeable amount of mica, which indicates an admixture of material from micaceous rock.

Representative profile:

0 to 7 inches, grayish-brown to dark grayish-brown (10YR 5/2 to 4/2) silt loam; under virgin conditions the surface 1 to 2 inches is dark brown.
7 to 30 inches, strong brown (7.5YR 5/6 to 5/8), approaching yellowish-red, friable silty clay loam of weak nut structure.

16 to 30 inches, red (2.5YR 4/6, dry) or dark-red (2.5YR 3/6, moist) friable clay loam or sandy clay loam with a medium, moderately developed, blocky structure; firm when dry.

30 inches +, predominantly reddish brown friable fine sandy loam or clay loam with streaks and splotches of yellow and brown; material becomes looser and more sandy with depth and in places is nearly free of sand; in some areas the underlying material is hard grayish or pinkish calcareous sandstone that has the appearance of limestone, in others it is soft laminated brown, yellow, and very dark-olive sandy shalelike residuum.

YELLOW MEMBERS

The yellow members of the Red-Yellow Podzolic great soil group (*16*) are zonal soils having thin organic and organic-mineral layers over a grayish-yellow leached layer that rests on a yellowish horizon. These soils in Knox County (see table 7) have undulating to steep relief and were developed under a forest vegetation that consisted mainly of deciduous trees with an admixture of pines in places. There may have been more pines and a somewhat less luxuriant and different kind of undergrowth on the yellow members than on the red members of the Red-Yellow Podzolic soils of the area. The degree to which there was uniformity in such a relationship is unknown. Climatic conditions for soils of the two groups were apparently similar.

The causes for development of pronounced color differences between the yellow and the red members are not known. It appears, however, that the yellow members of the county generally have parent materials either lower in bases or less well drained internally than the parent materials of the red members. The parent materials for the yellow members were derived from cherty limestone, interbedded limestone and shale, pure shale, and old alluvium.

Clarksville series

The Clarksville soils developed from cherty dolomitic limestone. They are noted for their chertiness, light-gray surface layer, yellowish subsoil, and great depth to bedrock. Internal drainage is moderate, and the content of organic matter and plant nutrients usually is notably low. There is some evidence that Clarksville soils do not hold plant nutrients so well as the Decatur, Dewey, and other red members. The Clarksville soils developed on undulating to steep relief, and relatively young profiles on steeper relief are included in the mapping. The reaction of the soils is strongly acid.

A representative profile:

0 to 8 inches, pale-yellow or virtually gray (dry) or light yellowish-brown (10YR 6/4, moist) cherty silt loam; virgin areas have a thin layer containing partly disintegrated organic matter.

8 to 20 inches, pale-yellow (2.5Y 7/4) cherty silt loam.

20 to 50 inches, strong-brown (7.5YR 5/8) or brownish-yellow (with some yellow and gray splotches in the lower part) firm cherty silty clay loam or cherty silty clay.

50 inches +, variegated or reticulated reddish-yellow, yellow, and gray firm to very firm cherty silty clay; cherty dolomitic limestone bedrock at depths of 20 to 40 feet.

Sequatchie series

The Sequatchie soil developed on low stream terraces consisting of mixed general alluvium that contains a notable amount of sandy material. The profile is much less strongly developed than that of many other zonal soils. Most areas lie approximately 15 feet above the adjoining bottoms and have an undulating or gently billowy surface. The soil is well drained, medium acid in most places, permeable, and of moderate fertility. It has a moderate content of organic matter.

Description of a typical profile:

0 to 10 inches, pale-brown (dry) or brown (10YR 4/3, moist), friable fine sandy loam.

10 to 18 inches, yellowish-brown (dry) or brown (7.5YR 4/4, moist) moderately firm fine sandy clay loam with a medium, moderate to weak, nut structure.

18 to 30 inches, brownish-yellow to yellowish-brown (dry) or strong brown (moist) moderately firm fine sandy clay loam with a moderately developed nut structure; material variable below this depth—in some places grades to lighter colored more sandy material, in others to finer textured material with occasional mottles.

Jefferson series

Jefferson soils occur on gently sloping foot slopes below the steep ridges of Muskingum and Lehew soils. They developed on old colluvium or local alluvium from these soils. Most areas have well-developed zonal profiles. Nevertheless, the underlying, sedentary shale beds are in many places at such shallow depth as to cause the Jefferson solum to be thin. The content of organic matter is low, and the general level of fertility is not high. The reaction is medium to strongly acid. The solum is permeable, but the underlying shale interferes somewhat with percolation of moisture.

Description of a representative profile:

0 to 8 inches, yellowish-gray or very pale-brown (dry) or pale-brown (10YR 6/3, moist) loam; in virgin areas the surface inch is dark gray (10YR 4/1) and contains much partly disintegrated organic matter.

8 to 22 inches, brownish-yellow (10YR 6/6, dry) or yellow friable fine sandy clay loam with a medium, moderately developed, nut structure.

22 to 36 inches, mottled or reticulated yellow, strong-brown, and gray moderately firm but friable clay loam; mottles weak in the upper part but strong in the lower; shale bedrock at depths of 2 to 12 feet.

There are some pebbles and sandstone fragments in the profile and on the surface in places.

Leadvale series

The Leadvale soils have developed on moderately old to old local alluvium that came chiefly from soils developed over shales. They are closely associated with Cotaco and Whitesburg soils and are mapped with them in undifferentiated units. The Leadvale soils have shale within a depth of 4 to 8 feet in most places, although it may be as deep as 15 feet. Internal drainage is moderately slow, as indicated by the predominantly mottled condition below a depth of about 24 inches. The soils generally are low in organic matter and plant nutrients; they are medium to strongly acid even in the areas where the parent alluvium was derived from calcareous shale. The Leadvale solum is well developed, and in many places the mottled layer may be sufficiently compact to allow classifying Leadvale soil as a Planosol.

Tyler series

The Tyler soil is a poorly drained Planosol occurring in gentle depressions. In some places the parent material is mixed general alluvium, and in others it is local alluvium derived mainly from soils developed from shales. Like the Guthrie soil, it is predominantly gray and has a compact or tight subsoil. Internal drainage and surface runoff are very slow. The natural fertility is low, and the reaction is medium to strongly acid.

Following is a description of a profile of Tyler silt loam:

0 to 6 inches, light-gray (10YR 7/2, dry) or grayish-brown (10YR 5/2, moist) friable silt loam; very dark-brown and yellow mottlings common to this layer; virgin areas have a notable amount of partly disintegrated organic matter in the surface inch.
6 to 12 inches, very pale-brown (10YR 7/3, dry) very firm silty clay loam to clay with gray and yellow mottlings.
12 to 36 inches, mottled gray and yellow very firm clay.

ALLUVIAL SOILS

The Alluvial great soil group (*16*) consists of an azonal group of soils developed from transported and relatively recently deposited material (alluvium) characterized by a weak modification (or none) of the material by soil-forming processes. In this county these soils (see table 7 p. 221) are on first bottom lands along streams, in depressions, and along drainageways that extend into the upland areas that have nearly level, gently sloping, and depressional relief and good to very slow internal drainage. They have the common properties of soils that lack a soil profile with genetically related horizons. The properties of these soils are closely related to the alluvial deposits. Alluvial soils derived from similar parent material but differing in drainage have been divided according to properties associated with good, imperfect, or poor drainage.

Huntington-Lindside-Roane-Melvin series

The Huntington, Lindside, and Melvin series constitute a cantena of soils derived from mixed general alluvium that apparently has been strongly influenced or dominated by limestone material. Much of their acreage is only slightly acid, and parts may be neutral. Huntington soils are well drained, Lindside imperfectly drained, and Melvin poorly drained. The profiles are not well defined and are considered young to very young. In some places very recent deposits of alluvium are on the surface, and exposure of the profile shows a somewhat older darker surface layer at depths ranging from 6 to 24 inches.

Following is a profile description of Huntington silt loam:

0 to 12 inches, brown (10YR 5/3, dry) or very dark grayish-brown (10YR 3/2, moist) silt loam.
12 to 30 inches, grayish-brown to brown (10YR 5/2 to 5/3, dry) or very dark grayish-brown (10YR 3/2, moist) heavy silt loam that breaks rather easily to irregular moderate-sized fragments.
30 to 50 inches +, pale-brown (10YR 6/3, dry) or brown (10YR 4/3, moist) silt loam to silty clay loam.

The upper 14 to 16 inches of the Lindside soil is quite similar to that of the Huntington. The Lindside profile differs chiefly in being mottled yellow, gray, and brown below this depth. In many places

the Lindside texture is finer and the consistence a little heavier than for the Huntington soils, but these differences are not consistent.

The Melvin soil is classed as an Alluvial soil with a gley horizon. Under average conditions the entire profile is relatively gray as compared to that of the Huntington or Lindside soils, and the subsoil is decidedly gray. In some places there is a layer of very recent alluvium, 6 to 14 inches thick and lighter colored than the somewhat older former surface layer directly below. Some areas of Melvin soil have taken on some characteristics of a Planosol—the subsoil is more compact and clayey than the surface layer.

Following is a description of a Melvin profile:

0 to 6 inches, brownish-gray or very pale-brown (10YR 7/3, dry) silt loam; brown mottlings or specks common; in virgin areas surface three-fourths inch or inch contains a notable amount of partly disintegrated organic matter.
6 to 20 inches, mottled gray, yellow, and strong-brown moderately plastic silty clay loam; in a few places may be silty clay; crushed mass very pale brown (10YR 7/4, dry).
20 inches +, light-gray, mottled with yellow and brown, plastic silty clay; crushed mass white to pale yellow (2.5Y 8/2 to 8/4, dry).

The Roane soil differs from the Huntington soils chiefly in its lighter color, notable amount of chert, lower fertility, and medium acid reaction. In places the cherty matrix at a depth of 24 to 30 inches may be partly cemented, forming a compact mass that is penetrated with difficulty. The Huntington, Lindside, and Melvin soils are on the bottom lands of the large streams such as the Holston and French Broad Rivers as well as the creeks. The Roane soil is confined to smaller stream bottoms where most of the alluvium originated from Clarksville and Fullerton soils.

Following is a description of Roane silt loam:

0 to 14 inches, brown friable silt loam (10YR 5/3, dry) or brown to dark-brown (10 YR 4/3 to 4/2, moist) silt loam to loam with some chert.
14 inches +, white to light-gray (10YR 8/2 to 7/2, dry) very cherty silty matrix; in some places browner, but on the whole light colored; in places mottled.

Staser-Hamblen-Prader series

The Staser, Hamblen, and Prader soils consist of young mixed general alluvium that originated mostly from soils developed over shales. In other words, the parent material for these soils is less influenced by limestone than that of the Huntington group.

This catena includes (1) the fine sandy loams of the bottom lands, which are associated with Huntington, Lindside, and Melvin soils; (2) the soils on the creek bottoms, which have been less influenced by limestone; and (3) the soils on the bottom lands, which consist of materials originating from Tellico soils. In general the soils of this catena are a little lower in fertility and more acid than those of the Huntington, Lindside, and Melvin catena. Nevertheless, they are not strongly acid. The profiles of the Staser and Hamblen soils are less brown than those of the Huntington and Lindside respectively.

Following is a description of the Staser silt loam profile:

0 to 12 inches, grayish-brown or light yellowish-brown (10YR 6/4, dry) silt loam.
12 to 24 inches, light grayish-brown (10YR 6/3, dry) heavy silt loam.

12 to 24 inches, grayish-brown (10YR 5/2, dry) or dark grayish-brown or dark-brown (10YR 3/2, moist) silty clay loam that comes from place in moderately firm pieces.
24 inches +, mottled yellow and gray silty clay loam; in most areas mottling is at a shallower depth, and the dark layer at 12 to 24 inches, representing a buried surface layer, is not always present.

Whitesburg, Cotaco, and Neubert series

Soils of the Whitesburg, Cotaco, and Neubert series consist of young local alluvium. The Whitesburg is composed principally of material from soils over calcareous shale, chiefly Dandridge and Litz soils; the Cotaco, of material derived from sandstone or sandy shale, chiefly Muskingum, Lehew, and Jefferson soils; and the Neubert, of material chiefly from Tellico soils. All are along drainageways that rise in areas of the upland soils listed. Internal drainage of much of the acreage of Whitesburg and Cotaco soils is moderately poor, whereas the Neubert soils are moderately well drained. All of these soils have weakly or very weakly developed profiles and commonly consist of an Alluvial soil profile buried by a very recent deposit of lighter colored alluvium.

The Whitesburg profile consists predominantly of 10 inches or more of brownish-gray silt loam over light-yellow silt loam that extends to a depth of 18 inches. Below this is mottled yellow and gray friable silty clay loam. Most of this soil is weakly acid to neutral.

The Cotaco soil consists of 8 or 10 inches of yellowish-gray fine sandy loam, below which is yellow friable fine sandy clay loam. Below a depth of about 20 inches is mottled yellow, gray, and brown friable very fine sandy clay loam or silty clay loam. This soil is medium to strongly acid.

The Neubert soils consist of about 12 inches of reddish-brown (5YR 5/3, dry) loam underlain by reddish-brown or brownish-red friable clay loam. These soils are noticeably permeable in most places and medium acid.

LITHOSOLS

The Lithosol great soil group (*16*) is an azonal group of soils having no clearly expressed soil morphology and consisting of a freshly and imperfectly weathered mass of rock fragments, largely confined to steeply sloping land. The positions these soils occupy (see table 7) are conducive to relatively rapid geologic erosion. The soils generally consist of materials that are easily eroded. As a result, material is removed from the surface or so mixed that soil-forming processes have not acted on it long enough to produce well-defined genetic soil properties. As mapped these soils may include small areas of zonal soils.

Armuchee series

Well defined A, B, and C horizons have not developed in the Armuchee soils; cultivation and accelerated erosion have tended to obliterate the incipient horizon differentiation found in virgin areas. These soils have developed on hilly to steep relief from weathered products of interbedded limestone and shale similar to those underlying the Sequoia soils. Normal erosion in the Armuchee soils, however, has kept pace with weathering processes, and the well-defined A, B, and C profile of the Sequoia soil has not developed. The difference between the Armuchee and the Litz soil apparently results from the higher percentage of limestone in the parent rock of the Armuchee series.

A representative Armuchee profile is as follows:

0 to 1 inch, dark-gray, very friable silt loam, high in organic matter.
1 to 6 inches, brownish-gray friable silt loam with a weak, medium crumb structure.
6 to 20 inches, reddish-yellow to yellowish-red plastic silty clay splotched with red, yellow, gray, and brown; numerous shale fragments.
20 inches +, interbedded shale and limestone; the lime is leached out of the upper 1 to 2 feet in most places.

In some places slight illuviation is recognizable in a layer lying between depths of 6 and 12 inches. In this layer the material is a uniform reddish-yellow silty clay with medium, weakly developed, blocky structure.

Dandridge series

The soils of the Dandridge series have formed from the residuum of calcareous shale. They are predominantly hilly to very steep. On such areas natural erosion apparently has been almost rapid enough to keep pace with soil development; consequently, the soils are shallow, contain numerous shale fragments, and have very weakly developed profiles. These soils are neutral to slightly acid.

Representative profile:

0 to 1 inch, brownish-gray very friable silt loam stained dark with organic matter.
1 to 6 inches, yellowish-gray friable shaly silt loam.
6 to 24 inches, brownish-yellow to reddish-yellow moderately plastic shaly silty clay loam; contains large amount of soft partially disintegrated shale fragments; layer lighter in the lower part and mottled with yellow and gray.
24 inches +, calcareous shale bedrock.

Litz series

The Litz soils have developed chiefly from soft acid shale interbedded with widely spaced layers of limestone or calcareous shale that is leached to a depth of several feet. In some of the parent material the layers of limestone have disappeared through weathering, and only shale remains at the surface. The parent rocks differ from those of the Armuchee in containing much less limestone.

The Litz soils are prevailingly very shallow—shallower and lighter colored than the Armuchee soils. They typically range from about 4 to 14 inches in depth to shale. The soil material is predominantly grayish-yellow friable silt loam to silty clay loam. Shale fragments are generally numerous throughout the soil mass. In woods and old pastures the topmost 1 or 2 inches of soil is stained dark with organic matter. The soil is prevailingly moderately to strongly acid. In a few places there is a weakly developed profile somewhat similar to that of the Sequoia soils.

Following is a typical profile:

0 to 4 inches, yellowish-gray silt loam; under virgin conditions the upper part of the layer contained a notable amount of partly disintegrated organic matter.
4 to 12 inches, brownish-yellow or reddish-yellow firm but friable silty clay loam that may contain some shale fragments; variegated brown, yellow, and red soft shale below this; dark-gray calcareous shale may be at a depth of about 5 feet.

" 1990 US Census Data "

USBC 1990. United States Bureau of the Census. 1990 US Census Data.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

Date: Tue, 9 Dec 1997 08:18:32 -0500 (EST)
From: burl h maupin <bhm@kornet.org>
To: bhm@kornet.org
Subject: 881673579

(no URL reload available)

1990 US Census Data
Database: C90STF3A
Summary Level: State--County

Knox County: FIPS.STATE=47, FIPS.COUNTY90=093

```
PERSONS
Universe: Persons
Total.......................................................335749
UNWEIGHTED SAMPLE COUNT OF PERSONS
Universe: Persons
Total........................................................44169
100-PERCENT COUNT OF PERSONS
Universe: Persons
Total.......................................................335749
PERCENT OF PERSONS IN SAMPLE
Universe: Persons
Total.........................................................13.2
FAMILIES
Universe: Families
Total........................................................91357
HOUSEHOLDS
Universe: Households
Total.......................................................133584
URBAN AND RURAL
Universe: Persons
Urban:
  Inside urbanized area.....................................261024
  Outside urbanized area.........................................0
Rural:
  Farm........................................................1233
  Nonfarm....................................................73492
PERSONS IN HOUSEHOLD
Universe: Households
1 person.....................................................36314
2 persons....................................................44773
3 persons....................................................24431
4 persons....................................................18937
5 persons.....................................................6466
6 persons.....................................................1934
7 or more persons..............................................729
HOUSEHOLD TYPE AND PRESENCE AND AGE OF CHILDREN
Universe: Households
Family households:
  Married-couple family:
    With own children under 18 years.........................31759
    No own children under 18 years...........................41353
  Other family:
    Male householder, no wife present:
      With own children under 18 years........................1427
      No own children under 18 years..........................1786
    Female householder, no husband present:
      With own children under 18 years........................7608
      No own children under 18 years..........................7424
```

Nonfamily households	42227
FAMILY TYPE AND PRESENCE AND AGE OF CHILDREN	
Universe: Families	
Married-couple family:	
With children 18 years and over	12968
No children 18 years and over	60144
Other family:	
Male householder, no wife present:	
With children 18 years and over	988
No children 18 years and over	2225
Female householder, no husband present:	
With children 18 years and over	6083
No children 18 years and over	8949
FAMILY TYPE AND AGE OF CHILDREN	
Universe: Own children under 18 years	
In married-couple family:	
Under 3 years	9847
3 and 4 years	6415
5 years	3090
6 to 11 years	18123
12 and 13 years	5639
14 years	2756
15 to 17 years	8590
In other family:	
Male householder, no wife present:	
Under 3 years	291
3 and 4 years	167
5 years	147
6 to 11 years	766
12 and 13 years	212
14 years	125
15 to 17 years	386
Female householder, no husband present:	
Under 3 years	1430
3 and 4 years	1170
5 years	731
6 to 11 years	4541
12 and 13 years	1445
14 years	772
15 to 17 years	2315
GROUP QUARTERS	
Universe: Persons in group quarters	
Institutionalized persons (00I-99I):	
Correctional institutions (20I-24I, 27I, 28I, 95I)	760
Nursing homes (60I-67I)	1904
Mental (Psychiatric) hospitals (45I-48I)	472
Juvenile institutions (01I-05I, 10I-12I, 15I)	41
Other institutions (00I, 06I-09I, 13I, 14I, 16I-19I, 25I, 26I,29I-	97
Other persons in group quarters (00N-99N):	
College dormitories (87N)	7800
Military quarters (96N-98N)	0
Emergency shelters for homeless persons (82N, 83N)	394
Visible in street locations (84N, 85N)	80
Other noninstitutional group quarters (00N-81N, 86N, 88N-95N, 99N)	779
SCHOOL ENROLLMENT AND TYPE OF SCHOOL	
Universe: Persons 3 years and over	
Enrolled in preprimary school:	
Public school	3193
Private school	2139
Enrolled in elementary or high school:	
Public school	46610
Private school	3255
Enrolled in college:	
Public school	28712

Private school........2997
Not enrolled in school........235993

SCHOOL ENROLLMENT, EDUCATIONAL ATTAINMENT, AND EMPLOYMENT STATUS
Universe: Persons 16 to 19 years
In Armed Forces:
  Enrolled in school:
    High school graduate........0
    Not high school graduate........0
  Not enrolled in school:
    High school graduate........22
    Not high school graduate........0
Civilian:
  Enrolled in school:
    Employed........6185
    Unemployed........1069
    Not in labor force........9654
  Not enrolled in school:
    High school graduate:
      Employed........1497
      Unemployed........174
      Not in labor force........330
    Not high school graduate:
      Employed........873
      Unemployed........322
      Not in labor force........1037

INDUSTRY
Universe: Employed persons 16 years and over
Agriculture, forestry, and fisheries (000-039)........1965
Mining (040-059)........379
Construction (060-099)........10133
Manufacturing, nondurable goods (100-229)........13259
Manufacturing, durable goods (230-399)........10632
Transportation (400-439)........6743
Communications and other public utilities (440-499)........6395
Wholesale trade (500-579)........8806
Retail trade (580-699)........32470
Finance, insurance, and real estate (700-720)........8452
Business and repair services (721-760)........7943
Personal services (761-799)........5014
Entertainment and recreation services (800-811)........1843
Professional and related services (812-899):
  Health services (812-840)........15164
  Educational services (842-860)........16041
  Other professional and related services (841, 861-899)........12817
Public administration (900-939)........5530

SOURCE OF WATER
Universe: Housing units
Public system or private company........137069
Individual well:
  Drilled........5345
  Dug........681
Some other source........487

SEWAGE DISPOSAL
Universe: Housing units
Public sewer........107538
Septic tank or cesspool........35435
Other means........609

PLUMBING FACILITIES
Universe: Housing units
Complete plumbing facilities........142756
Lacking complete plumbing facilities........826

PLUMBING FACILITIES
Universe: Vacant housing units
Complete plumbing facilities........9759

Date: Tue, 9 Dec 1997 11:07:51 -0500 (EST)
From: burl h maupin <bhm@korrnet.org>
To: bhm@korrnet.org
Subject: 881683740

(no URL reload available)

1990 US Census Data
Database: C90STF3C1
Summary Level: Metropolitan Statistical Area

Knoxville, TN MSA: MSACMSA=3840, GEOCOMP=00

PERSONS
Universe: Persons
Total..604816
UNWEIGHTED SAMPLE COUNT OF PERSONS
Universe: Persons
Total..87819
100-PERCENT COUNT OF PERSONS
Universe: Persons
Total..604816
PERCENT OF PERSONS IN SAMPLE
Universe: Persons
Total..14.5
FAMILIES
Universe: Families
Total..170513
HOUSEHOLDS
Universe: Households
Total..237614
URBAN AND RURAL
Universe: Persons
Urban:
  Inside urbanized area..303421
  Outside urbanized area.......................................62220
Rural:
  Farm...8134
  Nonfarm..231041
PERSONS IN HOUSEHOLD
Universe: Households
1 person...59012
2 persons..81500
3 persons..45433
4 persons..34975
5 persons..11973
6 persons..3465
7 or more persons..1256
HOUSEHOLD TYPE AND PRESENCE AND AGE OF CHILDREN
Universe: Households
Family households:
  Married-couple family:
    With own children under 18 years...........................60402
    No own children under 18 years.............................79460
  Other family:
    Male householder, no wife present:
      With own children under 18 years.........................2539
      No own children under 18 years...........................3315
    Female householder, no husband present:
      With own children under 18 years.........................12416
      No own children under 18 years...........................12381

Nonfamily households..67101
FAMILY TYPE AND PRESENCE AND AGE OF CHILDREN
Universe: Families
Married-couple family:
  With children 18 years and over..............................24794
  No children 18 years and over...............................115068
Other family:
  Male householder, no wife present:
    With children 18 years and over.............................1935
    No children 18 years and over...............................3919
  Female householder, no husband present:
    With children 18 years and over............................10352
    No children 18 years and over..............................14445
FAMILY TYPE AND AGE OF CHILDREN
Universe: Own children under 18 years
In married-couple family:
  Under 3 years..17266
  3 and 4 years..11705
  5 years...5694
  6 to 11 years..34542
  12 and 13 years..11189
  14 years..5667
  15 to 17 years...16972
In other family:
  Male householder, no wife present:
    Under 3 years..484
    3 and 4 years..307
    5 years..222
    6 to 11 years...1232
    12 and 13 years..388
    14 years...260
    15 to 17 years...800
  Female householder, no husband present:
    Under 3 years...2201
    3 and 4 years...1997
    5 years...1191
    6 to 11 years...7296
    12 and 13 years...2446
    14 years..1190
    15 to 17 years..3712
GROUP QUARTERS
Universe: Persons in group quarters
Institutionalized persons (00I-99I):
  Correctional institutions (20I-24I, 27I, 28I, 95I)............1212
  Nursing homes (60I-67I).......................................3903
  Mental (Psychiatric) hospitals (45I-48I)......................648
  Juvenile institutions (01I-05I, 10I-12I, 15I).................220
  Other institutions (00I, 06I-09I, 13I, 14I, 16I-19I, 25I, 26I, 29I 165
Other persons in group quarters (00N-99N):
  College dormitories (87N).....................................9321
  Military quarters (96N-98N)......................................0
  Emergency shelters for homeless persons (82N, 83N).............399
  Visible in street locations (84N, 85N)..........................80
  Other noninstitutional group quarters (00N-81N, 86N, 88N-95N, 99N)....1056
SCHOOL ENROLLMENT AND TYPE OF SCHOOL
Universe: Persons 3 years and over
Enrolled in preprimary school:
  Public school...5577
  Private school..2903
Enrolled in elementary or high school:
  Public school..89754
  Private school..4299
Enrolled in college:
  Public school..37255

Private school.......................................6303
Not enrolled in school.............................436345
RACE BY SCHOOL ENROLLMENT, EDUCATIONAL ATTAINMENT,
AND EMPLOYMENT STATUS
Universe: Persons 16 to 19 years
White:
In Armed Forces:
Enrolled in school:
High school graduate..................................7
Not high school graduate..............................0
Not enrolled in school:
High school graduate.................................32
Not high school graduate..............................0
Civilian:
Enrolled in school:
Employed...9654
Unemployed...1600
Not in labor force................................14789
Not enrolled in school:
High school graduate:
Employed...2901
Unemployed..374
Not in labor force..................................499
Not high school graduate:
Employed...1579
Unemployed..713
Not in labor force.................................1503
Black:
In Armed Forces:
Enrolled in school:
High school graduate..................................0
Not high school graduate..............................0
Not enrolled in school:
High school graduate..................................0
Not high school graduate..............................0
Civilian:
Enrolled in school:
Employed..462
Unemployed..247
Not in labor force.................................1560
Not enrolled in school:
High school graduate:
Employed...79
Unemployed...24
Not in labor force..................................132
Not high school graduate:
Employed...66
Unemployed...23
Not in labor force..................................317
American Indian, Eskimo, or Aleut:
In Armed Forces:
Enrolled in school:
High school graduate..................................0
Not high school graduate..............................0
Not enrolled in school:
High school graduate..................................0
Not high school graduate..............................0
Civilian:
Enrolled in school:
Employed...48
Unemployed..0
Not in labor force....................................5
Not enrolled in school:
High school graduate:

Employed 18
Unemployed 0
Not in labor force 0
Not high school graduate:
Employed 3
Unemployed 13
Not in labor force 6
Asian or Pacific Islander:
In Armed Forces:
Enrolled in school:
High school graduate 0
Not high school graduate 0
Not enrolled in school:
High school graduate 0
Not high school graduate 0
Civilian:
Enrolled in school:
Employed 55
Unemployed 0
Not in labor force 217
Not enrolled in school:
High school graduate:
Employed 7
Unemployed 0
Not in labor force 0
Not high school graduate:
Employed 11
Unemployed 0
Not in labor force 14
Other race:
In Armed Forces:
Enrolled in school:
High school graduate 0
Not high school graduate 0
Not enrolled in school:
High school graduate 0
Not high school graduate 0
Civilian:
Enrolled in school:
Employed 8
Unemployed 10
Not in labor force 27
Not enrolled in school:
High school graduate:
Employed 12
Unemployed 2
Not in labor force 0
Not high school graduate:
Employed 8
Unemployed 0
Not in labor force 0
INDUSTRY
Universe: Employed persons 16 years and over
Agriculture, forestry, and fisheries (000-039) 4815
Mining (040-059) 1352
Construction (060-099) 20388
Manufacturing, nondurable goods (100-229) 24260
Manufacturing, durable goods (230-399) 27362
Transportation (400-439) 11415
Communications and other public utilities (440-499) 9544
Wholesale trade (500-579) 12804
Retail trade (580-699) 55714
Finance, insurance, and real estate (700-720) 13597
Business and repair services (721-760) 12959

Personal services (761-799) 9718
Entertainment and recreation services (800-811) 3501
Professional and related services (812-899):
Health services (812-840) 24227
Educational services (842-860) 24577
Other professional and related services (841, 861-899) 19557
Public administration (900-939) 10175
SOURCE OF WATER
Universe: Housing units
Public system or private company 218777
Individual well:
Drilled 34242
Dug 4073
Some other source 3878
SEWAGE DISPOSAL
Universe: Housing units
Public sewer 151844
Septic tank or cesspool 105646
Other means 3480
PLUMBING FACILITIES
Universe: Housing units
Complete plumbing facilities 257175
Lacking complete plumbing facilities 3795
PLUMBING FACILITIES
Universe: Vacant housing units
Complete plumbing facilities 22101
Lacking complete plumbing facilities 1047
RACE OF HOUSEHOLDER BY PLUMBING FACILITIES
Universe: Occupied housing units
White:
C

Mental (Psychiatric) hospitals (45I-48I)..............................2849
Juvenile institutions (01I-05I, 10I-12I, 15I)........................2194
Other institutions (00I, 06I-09I, 13I, 14I, 16I-19I, 25I, 26I, 29.....3819
Other persons in group quarters (00N-99N):
College dormitories (87N)..43683
Military quarters (96N-98N)..11126
Emergency shelters for homeless (82N, 83N)...........................1864
Visible in street locations (84N, 85N)...............................357
Other noninstitutional group quarters (00N-81N, 86N, 88N-95N, 99N).....6710
HOUSING UNITS
Universe: Housing units
Total..2026067
URBAN AND RURAL
Universe: Housing units
Urban:
Inside urbanized area..0
Outside urbanized area...0
Rural..0
Not defined for this file..2026067
PERSONS IN UNIT
Universe: Occupied housing units
1 person...442129
2 persons..610548
3 persons..359963
4 persons..283892
5 persons..105680
6 persons..32738
7 or more persons..18775
PERSONS PER OCCUPIED HOUSING UNIT
Universe: Occupied housing units
Persons per occupied housing unit......................................2.56

REFERENCE

"Rainfall Frequency Atlas of the United States"

USDC. 1993. Rainfall Frequency Atlas of the United States. U.S. Department of Commerce, Hydrologic Services Division. July. Chart 44, page: 95.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

FEB 1 3 1995

U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges, Secretary

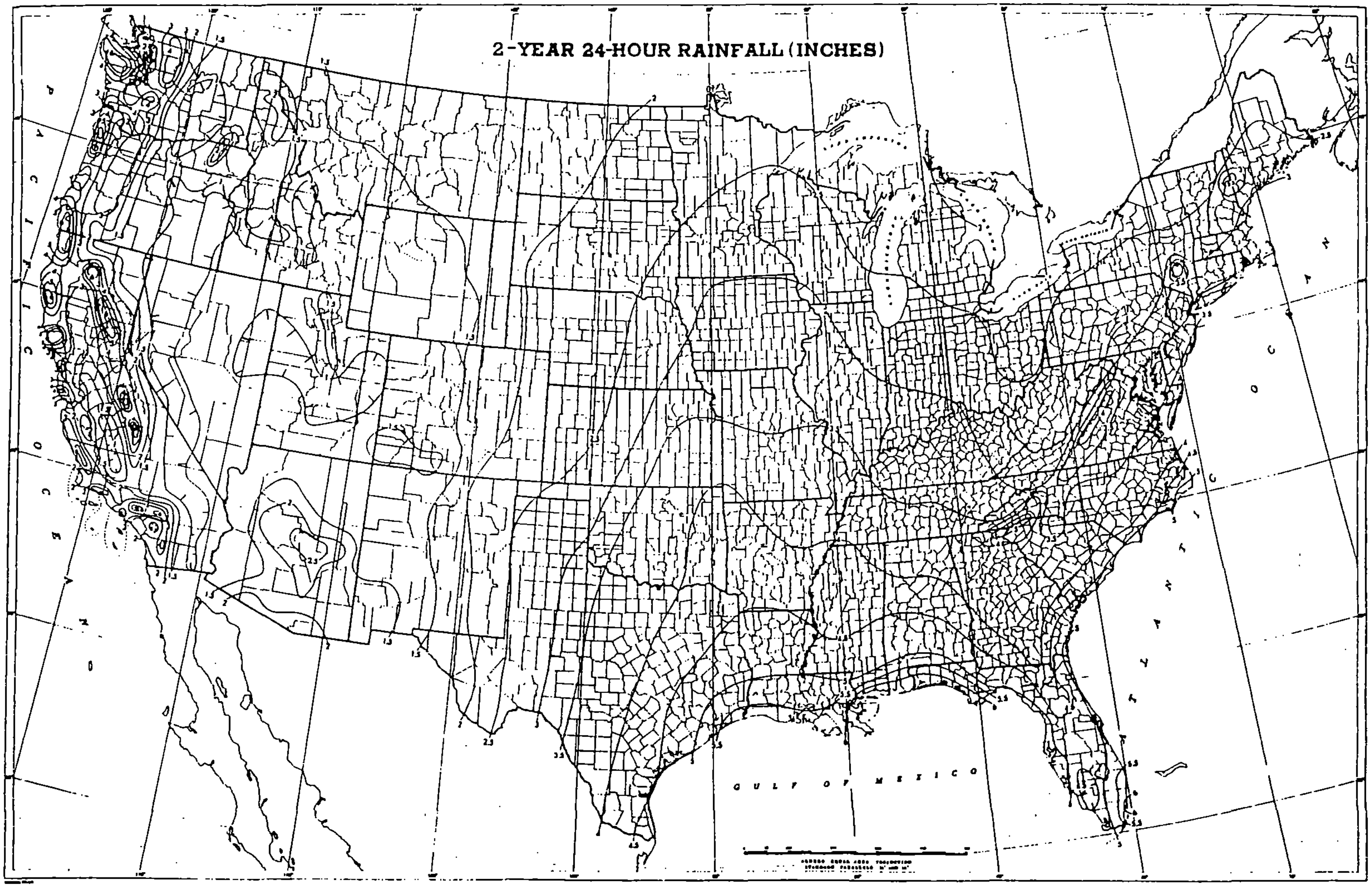
WEATHER BUREAU
F. W. Reichelderfer, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture


2-YEAR 24-HOUR RAINFALL (INCHES)
P A C I F I C O C E A N
A T L A N T I C O C E A N
G U L F O F M E X I C O

" Climatic Atlas of the United States "

USDC/NOAA. 1968. Climatic Atlas of the United States. U. S. Department of Commerce, National Oceanic and Atmospheric Administration. June. page: 78.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

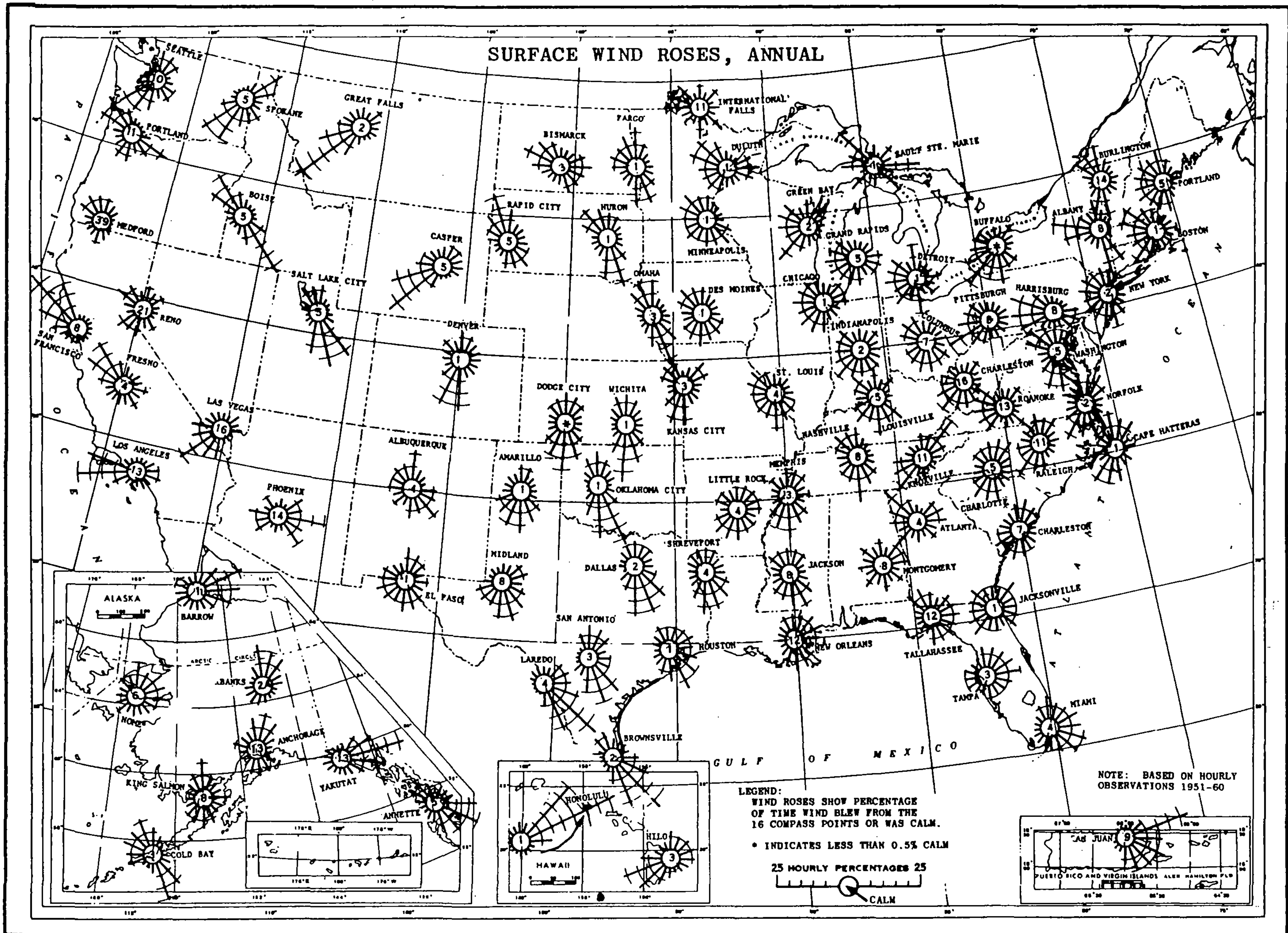
; RESULTANT SURFACE WINDS, MIDSEASONAL - Continued

ANNUAL PERCENTAGE FREQUENCY OF WIND BY SPEED GROUPS AND THE MEAN SPEED

STATE AND STATION	0 - 3 m.p.h.	4 - 7 m.p.h.	8 - 12 m.p.h.	13 - 18 m.p.h.	19 - 24 m.p.h.	25 - 31 m.p.h.	32 - 38 m.p.h.	39 - 46 m.p.h.	47 m.p.h. and over	Mean speed m.p.h.
ALA. Birmingham	27	22	30	17	3	1	*	*	*	7.9
Mobile	7	28	38	20	6	1	*	*	*	10.0
Montgomery	31	29	27	12	2	*	*			6.9
ALASKA, Anchorage	28	35	25	11	2	*	*	*		6.8
Cold Bay	4	9	18	27	21	14	5	2	*	17.4
Fairbanks	40	35	19	5	1	*	*	*		5.2
King Salmon	11	20	30	24	10	4	1	*	*	11.4
ARIZ. Phoenix	38	36	20	5	1	*	*	*		5.4
Tucson	18	35	30	14	3	1	*	*		8.1
ARK. Little Rock	12	30	39	16	2	*	*	*		8.7
CALIF. Bakersfield	35	30	24	10	1	*	*			5.8
Burbank	52	26	18	4	1	*	*	*		4.5
Fresno	30	41	22	7	1	*	*			6.1
Los Angeles	28	33	27	11	1	*	*			6.8
Oakland	26	28	28	16	2	1	*	*	*	7.5
Sacramento	15	28	31	18	5	1	*	*	*	9.3
San Diego	28	38	28	6	*	*	*			6.3
San Francisco	16	21	26	22	11	3	*	*	*	10.6
COLO. Colorado Springs	9	27	38	19	6	2	*	*	*	10.0
Denver	11	27	34	22	5	2	*	*	*	10.0
CONN. Hartford	13	26	32	24	6	1	*	*	*	9.8
D.C. Washington	11	26	35	22	5	1	*	*	*	9.7
DEL. Wilmington	15	31	30	19	4	1	*	*	*	8.8
FLA. Jacksonville	10	33	35	18	3	*	*	*		8.9
Miami	14	30	34	20	2	*	*	*	*	8.8
Orlando	18	28	32	17	4	*	*	*		8.6
Tallahassee	33	36	23	7	*	*				6.1
Tampa	9	31	40	16	2	*	*	*	*	8.8
West Palm Beach	9	22	36	27	6	1	*	*		10.5
GA. Atlanta	13	24	36	21	6	1	*	*		9.7
Augusta	36	29	25	9	1	*	*			6.3
Macon	10	26	46	16	2	*	*	*	*	8.9
Savannah	12	34	37	14	3	*	*	*	*	8.4
HAWAII, Hilo	7	34	43	15	2	*	*			8.7
Honolulu	9	17	27	32	12	2	*	*	*	12.1
IDAHO, Boise	15	30	32	18	4	1	*	*		8.9
ILL. Chicago (O'Hare)	8	22	33	27	8	2	*	*	*	11.2
Chicago (Midway)	7	26	36	25	5	1	*	*	*	10.2
Moline	14	23	32	24	7	2	*	*	*	10.0
Springfield	7	22	28	27	12	3	1	*	*	12.0
IND. Evansville	19	23	32	21	5	1	*	*		9.1
Fort Wayne	9	23	33	25	8	2	*	*	*	10.9
Indianapolis	9	22	34	26	7	2	*	*	*	10.8
South Bend	7	21	35	30	7	1	*	*		10.9
IOWA, Des Moines	3	17	38	29	10	3	1	*	*	12.1
Sioux City	10	20	31	25	10	4	1	*	*	11.7
KANS. Topeka	11	19	30	27	10	2	*	*	*	11.2
Wichita	4	12	30	31	16	5	1	*	*	13.7
KY. Lexington	8	25	39	22	6	1	*	*		10.1
Louisville	17	28	31	20	3	1	*	*		8.8
LA. Baton Rouge	17	29	34	17	3	*	*	*		8.3
Lake Charles	19	31	29	17	4	1	*	*	*	8.5
New Orleans	16	27	32	19	5	1	*	*	*	9.0
Shreveport	12	26	37	21	4	1	*	*	*	9.5
MAINE, Portland	10	30	33	22	4	1	*	*	*	9.6
MD. Baltimore	7	24	39	22	6	2	*	*	*	10.4
MASS. Boston	3	12	33	35	12	4	1	*	*	13.3
MICH. Detroit (City AP)	8	23	37	26	5	1	*	*	*	10.3
Flint	16	26	32	22	3	1	*	*	*	9.0
Grand Rapids	14	23	32	25	5	1	*	*	*	9.8
MINN. Duluth	6	15	33	31	11	4	1	*	*	12.6
Minneapolis	8	21	34	28	9	2	*	*	*	11.2
MISS. Jackson	33	25	26	14	2	*	*	*		7.1
MO. Kansas City	9	29	35	23	5	1	*			9.8
St. Louis	10	29	36	21	3	1	*	*	*	9.3
Springfield	4	13	34	32	13	3	1	*	*	12.9
MONT. Great Falls	7	19	24	24	15	9	3	1	*	13.9
NEBR. Omaha	12	17	29	28	11	3	*	*		11.6
NEV. Las Vegas	18	26	25	20	8	3	1	*	*	9.7
Reno	52	20	13	10	4	1	*	*	*	5.9
N. J. Newark	11	25	34	24	5	1	*	*	*	9.8
N. MEX. Albuquerque	17	36	26	13	5	2	*	*	*	8.6
N. Y. Albany	23	24	27	21	4	1	*	*		8.6
Binghamton	11	23	35	25	5	1	*	*	*	10.0
Buffalo	5	17	34	27	13	3	1	*	*	12.4
New York (Kennedy)	6	17	35	28	10	3	*	*	*	12.0
New York (La Guardia)	6	15	30	31	12	4	1	*	*	12.9
Rochester	8	22	34	25	9	2	1	*	*	11.2
Syracuse	14	27	30	23	5	1	*	*	*	9.7
N. C. Charlotte	20	32	31	14	2	*	*	*		7.9
Greensboro	20	32	31	14	2	*	*	*	*	8.0
Raleigh	18	33	34	14	2	*	*	*	*	7.7
Winston-Salem	19	22	33	21	4	1	*	*		9.0
N. DAK. Bismarck	14	20	27	24	12	3	1	*	*	11.2
Fargo	4	13	28	31	15	7	2	*	*	14.4
OHIO, Akron-Canton	7	25	35	26	5	1	*	*	*	10.4
Cincinnati	11	27	36	22	4	1	*	*	*	9.6
Cleveland	7	18	35	29	9	2	*	*	*	11.6
Columbus	26	23	29	18	4	1	*	*	*	8.2
Dayton	8	25	36	23	6	2	*	*	*	10.3
Youngstown	7	26	36	24	6	1	*	*	*	10.3
OKLA. Oklahoma City	2	11	34	34	13	6	1	*	*	14.0
OKLA. (Cont.) Tulsa	9	24	34	26	7	1	*	*	*	10.6
OREG. Medford	47	31	14	6	2	*	*	*	*	4.6
Portland	28	27	25	16	4	1	*	*	*	7.7
Salem	25	32	28	13	2	*	*			7.1
PA. Harrisburg	28	31	25	13	3	1	*	*		7.3
Philadelphia	11	27	35	21	5	1	*	*	*	9.6
Pittsburgh	12	26	34	22	4	1	*	*		9.4
Scranton	11	33	35	18	2	*	*	*		8.8
R. I. Providence	11	20	32	28	7	2	*	*	*	10.7
S. C. Charleston	12	28	35	19	4	1	*	*		9.2
Columbia	25	35	26	12	2	*	*			7.0
S. DAK. Huron	10	18	29	29	10	3	1	*	*	11.9
Rapid City	15	22	28	21	10	4	1	*	*	11.0
TENN. Chattanooga	39	25	24	11	1	*	*			6.1
Knoxville	29	29	25	12	4	1	*	*	*	7.5
Memphis	14	26	34	20	5	1	*	*		9.4
Nashville	27	31	25	14	2	*	*	*	*	7.2
TEX. Amarillo	5	15	32	32	12	4	1	*	*	12.9
Austin	13	25	34	23	5	1	*	*		9.7
Brownsville	10	17	25	30	14	3	*	*	*	12.3
Corpus Christi	11	16	26	33	12	2	*	*		11.9
Dallas	9	21	32	28	9	1	*	*		11.0
El Paso	10	22	32	22	9	4	1	*	*	11.3
Ft. Worth	4	14	34	34	10	3	*	*	*	12.5
Galveston	4	13	39	33	10	2	1	*	*	12.5
Houston	6	18	36	28	10	2	*	*	*	11.8
Laredo	6	15	32	34	12	1	*	*		12.3
Lubbock	4	11	33	34	13	5	1	*	*	13.6
Midland	9	22	38	26	4	1	*	*		10.1
San Antonio	18	23	32	22	4	1	*	*		9.3
Waco	3	14	36	35	10	2	*	*		12.5
Wichita Falls	5	22	41	27	5	1	*	*	*	10.5
UTAH, Salt Lake City	12	33	36	14	4	1	*	*	*	8.7
VT. Burlington	24	24	28	22	2	*	*			8.3
VA. Norfolk	14	23	30	25	6	1	*	*	*	10.2
Richmond	14	37	36	11	1	*	*	*		7.8
Roanoke	31	22	23	17	5	2	*	*		8.3
WASH. Seattle-Tacoma AP	13	16	35	26	8	2	*	*	*	10.7
Spokane	17	38	27	14	3	1	*	*		8.1
W. VA. Charleston	29	37	25	8	1	*	*			6.2
WIS. Green Bay	8	22	32	26	10	2	*	*	*	11.2
Madison	15	22	30	23	7	2	*	*	*	10.1
Milwaukee	8	17	31	30	11	3	1	*	*	12.1
WYO. Casper	8	16	27	27	13	7	2	*	*	13.3
PACIFIC, Wake Island	1	6	27	48	17	2	*	*		14.6
P. R. San Juan	15	28	27	25	4	*	*	*	*	9.1

Source: Climatography of the United States Series 82; Decennial Census of the United States Climate -- Summary of Hourly Observations, 1951-60 (Table B)

SURFACE WIND ROSES, MONTHLY AND ANNUAL; RESU



" Air Pollution - Its Origin and Control "

Wark K. And Warner C. 1981. Air Pollution - Its Origin and Control, Second Edition. New York: Harper & Row. Pp: 97 and 477.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

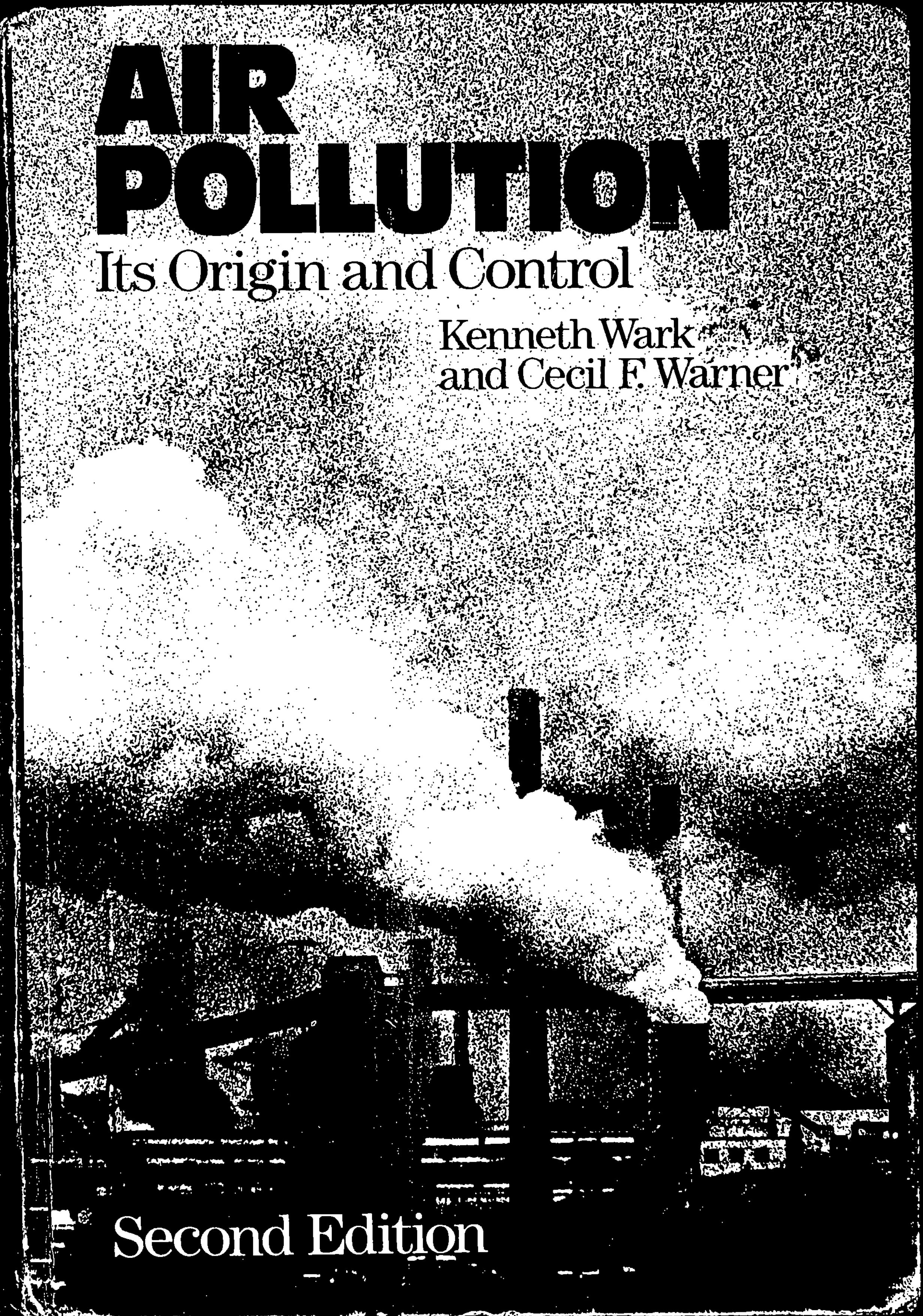

AIR POLLUTION
Its Origin and Control
Kenneth Wark
and Cecil F. Warner
Second Edition

Table 3-4 GLOBAL SOURCES, CONCENTRATIONS, AND ATMOSPHERIC REACTIONS OF TRACE GASES

POLLUTANT	MAJOR SOURCES	NATURAL SOURCES	ESTIMATED EMISSIONS (TONS)		ATMOSPHERIC BACKGROUND CONCENTRATION	CALCULATED ATMOSPHERIC RESIDENCE TIME	REMOVAL REACTIONS AND SINKS
			MAN-MADE	NATURAL			
SO_2	Combustion of coal and oil	Volcanoes	146×10^6	None	0.2 ppb	4 days	Oxidation to sulfate or after absorption by solid and liquid aerosols
H_2S	Chemical processes, sewage treatment	Volcanoes, biological action in swamp areas	3×10^6	100×10^6	0.2 ppb	2 days	Oxidation to SO_2
CO	Auto exhaust, other combustion	Forest fires, terpene reactions, oceans?	274×10^6	75×10^6	0.1 ppm	3 days	Soil fungi, large sink necessary
NO/NO_2	Combustion	Bacterial action in soil?	53×10^6	NO: 430×10^6 NO_2: 658×10^6	NO: 0.2–2 ppb NO_2: 0.5–4 ppb	5 days	Oxidation to nitrate after aerosol sorption, photochemical reactions
NH_3	Waste treatment	Biological decay	4×10^6	1160×10^6	6–20 ppb	7 days	Formation of ammonium sulfate, oxidation to nitrate
CO_2	Combustion, release from oceans, decay	Biological	1.4×10^{10}	10^{12}	320 ppm	2–4 yr	Absorption in oceans and biologically
HCs	Combustion, chemical processes	Biological	88×10^6	480×10^6	CH_4: 1.5 ppm	CH_4: 16 yr	Photochemical reactions, large sink necessary for methane

SOURCE: E. Robinson and R. C. Robbins. *Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants*. Stanford Research Institute, Report SRI Project PR-6755, February 1968. Supplemental Report, June 1969.

to meet these requirements. If values of K can be determined for various malodorous effluents, analytical instruments can be used to measure odor intensity directly and establish the degree of control required. These measurements can be made in the field, thus precluding the need to transport samples and to make allowances for fatigue and adaptation of the human olfactory sense.

An instrument for measuring the intensity of diesel exhaust odor has been developed by Arthur D. Little, Inc. [7]. An odor panel was employed in the determination of the chemical species of diesel exhaust which contribute to the characteristic burnt-oily odor. After those species were identified, values of the constants in an equation similar to the Weber-Fechner equation relating odor intensity to chemical concentration of the odorous species were determined. The instrument measures the concentration of the hydrocarbon species which are responsible for the diesel exhaust odor and by means of the intensity-concentration equation relates the measured concentration to an intensity readout scale.

11-5 ODOR THRESHOLD VALUES

As has been mentioned previously, the concentrations of odorous substances that can be detected by the human nose vary by many orders of magnitude. Examples of odor threshold concentrations for selected substances are presented in Table 11-1. An indication of the range of odor threshold concentrations of similar species is presented in Table 11-2 [8]. A more extensive list of the threshold concentrations of 100 petrochemicals using sensory methods has been published by Hellman and Small [9]. The magnitude of the odor control problem can be seen when we compare detection of acetone versus

Table 11-1 ODOR THRESHOLDS IN AIR

CHEMICAL	ODOR THRESHOLD (ppm)	ODOR DESCRIPTION
Acetic acid	1.0	Sour
Acetone	100.0	Chemically sweet
Amine monomethyl	0.021	Fishy, pungent
Amine trimethyl	0.0021	Fishy, pungent
Ammonia	46.8	Pungent
Carbon disulfide	0.21	Vegetable sulfide
Chlorine	0.314	Bleach, pungent
Diphenyl sulfide	0.0047	Burnt, rubbery
Formaldehyde	1.0	Hay or strawlike
Hydrogen sulfide	0.00047	Eggy
Methanol	100.	Sweet
Methylene chloride	214.	
Phenol	0.047	Medicinal

SOURCE: G. Leonardos, D. Kendall, and N. Bernard. "Odor Threshold Determinations of 53 Odorant Chemicals." *J. Air Pollu. Control Assoc.* 19, no. 2 (1969): 91–95.

" Directory of Tennessee Manufacturers "

White, J. 1995. Directory of Tennessee Manufacturers. M. Lee Smith Publishers and Printers LLC.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TND098071061
TSDF #47-559

REFERENCE

1995

DIRECTORY OF

TENNESSEE

MANUFACTURERS

PUBLISHED BY M. LEE SMITH PUBLISHERS & PRINTERS LLC

NEW FOR 1995:

Signal Chemical Corp.
Chattanooga (Hamilton)
Phone 615-265-0640
Page B-115

Signal Machine & Balancing Co. Inc.
Ft. Oglethorpe (Catoosa)
Phone 706-866-9885
Page B-2

Signal Mountain Cement Co.
Chattanooga (Hamilton)
Phone 615-886-0800
Page B-115

Signal Mtn. Cement Co.
Jasper (Marion)
Phone 615-942-2636
Page B-172

Signal Plating Div. of Metal Plate
Cleveland (Bradley)
Phone 615-472-7502
Page B-30

Signal Plating Inc.
Chattanooga (Hamilton)
Phone 615-624-9018
Page B-115

Signal Thread Co. Inc.
Chattanooga (Hamilton)
Phone 615-892-9591
Page B-115

Signs & Designs
Chattanooga (Hamilton)
Phone 615-624-6823
Page B-116

Signs By Scott
Murfreesboro (Rutherford)
Phone 615-896-4657
Page B-216

Signs First
Memphis (Shelby)
Phone 901-323-7874
Page B-249
Phone 901-365-7874
Page B-249

Sign-Up Enterprises & Design
Knoxville (Knox)
Phone 615-690-2082
Page B-153

Silvara Stone Co.
Crossville (Cumberland)
Phone 615-484-6653
Page B-48

Silver Furniture Co. Inc.
Knoxville (Knox)
Phone 615-637-4541
Page B-153

Silvey Sheet Metal Co. Inc.
Chattanooga (Hamilton)
Phone 615-267-8387
Page B-116

Simco Leather Co. Inc.
Chattanooga (Hamilton)
Phone 615-624-3331
Page B-116

Simerly Concrete Products Inc.
Bristol (Sullivan)
Phone 615-764-3128
Page B-258

Simmons Sign Co. Inc.
Memphis (Shelby)
Phone 901-525-3279
Page B-249

Singleton's Burlap Co.
Cleveland (Bradley)
Phone 615-472-1493
Page B-30

Sir Speedy Printing Center
Knoxville (Knox)
Phone 615-522-2334
Page B-153

Sixty-One Cabinet Shop
Memphis (Shelby)
Phone 901-396-0160
Page B-249

Sizemore Frame Shop Inc.
Morristown (Hamblen)
Phone 615-581-0110
Page B-101

Skaggs Iron Works Inc.
Memphis (Shelby)
Phone 901-947-3109
Page B-249

Skelton Lumber Co. Inc.
Waynesboro (Wayne)
Phone 615-722-3281
Page B-285

Skill Printing
Memphis (Shelby)
Phone 901-774-1804
Page B-249

Skullbone Printing Service
Bradford (Gibson)
Phone 901-742-2450
Page B-84

Skyline Coal Co.
Dunlap (Sequatchie)
Phone 615-949-4161
Page B-219

Skyline Manufacturing Corp.
Nashville (Davidson)
Phone 615-321-3330
Page B-68

Sledge-Craft Co.
Murfreesboro (Rutherford)
Phone 615-898-1223
Page B-216

Slender You Financial Inc.
Crossville (Cumberland)
Phone 615-484-0808
Page B-48

Slim EZ-Mr. America Mfg. Inc.
Ooltewah (Hamilton)
Phone 615-238-5388
Page B-121

Slip-Not Belting Corp.
Kingsport (Sullivan)
Phone 615-246-8141
Page B-261

Sloan Monument Co. Inc.
Lebanon (Wilson)
Phone 615-444-2224
Page B-295

SM Athletics Inc.
Knoxville (Knox)
Phone 615-966-3434
Page B-153

Smalley Mfg. Co. Inc.
Knoxville (Knox)
Phone 615-966-5866
Page B-153

Smartt Cabinets
Chattanooga (Hamilton)
Phone 615-266-8157
Page B-116

SMC Lumber Co.
Pulaski (Giles)
Phone 615-363-6553
Page B-90

Smelter Service Corp.
Mount Pleasant (Maury)
Phone 615-379-7765
Page B-179

Smith & Nephew Richards Inc.
Bartlett (Shelby)
Phone 901-373-0200
Page B-223
Memphis (Shelby)
Phone 901-396-2121
Page B-249

Smith County Coatings Inc.
Gordonsville (Smith)
Phone 615-683-3300
Page B-255

Smith Elevator & Mfg. Co. Inc.
Chattanooga (Hamilton)
Phone 615-266-7143
Page B-116

Smith Metal Works
Maury City (Crockett)
Phone 901-656-2098
Page B-47

Smith Metals Co. Inc.
Selmer (McNairy)
Phone 901-645-6302
Page B-186

Smith Welding & Iron Works Inc.
Knoxville (Knox)
Phone 615-573-4211
Page B-154

Smithfield Industries Inc.
Clarksville (Montgomery)
Phone 615-552-4327
Page B-191

SmithKline Beecham Pharmaceuticals
Bristol (Sullivan)
Phone 615-652-3100
Page B-258

Smithville Mfg. Inc.
Smithville (DeKalb)
Phone 615-597-4045
Page B-74

Smithville Review
Smithville (DeKalb)
Phone 615-597-5485
Page B-74

Smithville Tool & Die
Smithville (DeKalb)
Phone 615-597-6030
Page B-74

SMK Machine & Fabrication Inc.
Ringgold (Catoosa)
Phone 706-935-9105
Page B-3

Smokey Mountain Smelters Inc.
Knoxville (Knox)
Phone 615-573-4473
Page B-154

Smoky Mountain Industries
Cleveland (Bradley)
Phone 615-478-3892
Page B-30

Smoky Mountain Secrets
Alcoa (Blount)
Phone 615-970-3217
Page B-22

Smoky Mountain Winery Inc.
Gatlinburg (Sevier)
Phone 615-436-7551
Page B-220

Smoky Mtn. Country Hams
Madisonville (Monroe)
Phone 615-442-5003
Page B-187

Smoky Mtn. Vending-Sally's Salads
Sevierville (Sevier)
Phone 615-453-7158
Page B-221

Snap-On Tools Corp.
Elizabethton (Carter)
Phone 615-543-5771
Page B-36
Johnson City (Washington)
Phone 615-929-1193
Page B-282

Snapp Printing Co.
Greeneville (Greene)
Phone 615-638-4542
Page B-95

Snapvent Co.
Knoxville (Knox)
Phone 615-523-6784
Page B-154

Snell's Limbs & Braces Inc.
Jackson (Madison)
Phone 901-423-3121
Page B-171

Snyder Signs Inc.
Johnson City (Washington)
Phone 615-282-6221
Page B-282

Snyder's Inc.
Gray (Washington)
Phone 615-239-5671
Page B-277

Sofix Corp.
Chattanooga (Hamilton)
Phone 615-624-3500
Page B-116

SOLA/Hevi Duty
Celina (Clay)
Phone 615-243-3113
Page B-40

Solar-10 Inc.
Newport (Cocke)
Phone 615-623-1417
Page B-42

Solene Industrial Lubricants
Knoxville (Knox)
Phone 615-521-6444
Page B-154

Soltech Thermacoustics Div.
Cleveland (Bradley)
Phone 615-472-7186
Page B-30

Solution Fibers Inc.
La Fayette (Walker)
Phone 706-638-5678
Page B-6

Somerville Mills Mfg. Co.
Somerville (Fayette)
Phone 901-465-5353
Page B-81

Sonoco Products Co. Inc.
Chattanooga (Hamilton)
Phone 615-698-6985
Page B-116
Jackson (Madison)
Phone 901-424-3740
Page B-171
Memphis (Shelby)
Phone 901-942-2492
Page B-249
Newport (Cocke)
Phone 615-623-8611
Page B-42

Sossner Sales Corp.
Elizabethton (Carter)
Phone 615-543-4001
Page B-36

Sound Impressions
Nashville (Davidson)
Phone 615-244-3535
Page B-68

South & South Inc.
Columbia (Maury)
Phone 615-388-4732
Page B-178

South Knoxville Monument Co.
Knoxville (Knox)
Phone 615-522-0625
Page B-154

Bill Quillen, VP/Administration
Charles Wheeler, Engineering Mgr.
John Allen, Plant Mgr.
Phyllis Gifford, Purchasing Mgr.
Conveyors 3535
Market: National; Workers: 60
Plant Size: 35,000 Sq. Ft.
Annual Sales: $5,000,000
Computer: Hewlett Packard - 7311
Stnlss Steel 3312
Aluminum 3353
Electric Motors 3621
Conveyor Belts 3496

SMITH WELDING & IRON WORKS INC.
706 Redwine St
Knoxville TN 37920-1968
Phone: 615-573-4211
Established 1958
Milas Smith, President
Sam Beeler, Vice President
Steel Fabrication 3493
Ornamental Iron 3446
Market: Local; Workers: 3*
Plant Size: 3,500 Sq. Ft.
Annual Sales: $100,000
Stnlss Steel 3312
Cast Iron 3321

SMOKEY MOUNTAIN SMELTERS INC.
✆PO Box 2704
Knoxville TN 37901-2704
☒1455 Maryville Pike
Knoxville TN 37920-3954
Phone: 615-573-4473
FAX: 615-573-9546
Established 1979
Dan Johnson, Owner/President
Tammy Key, Office Mgr.*
Jim Burress, Plant Mgr.*
Aluminum Ingots 3334
Market: National; Workers: 19*
Plant Size: 69,000 Sq. Ft.
Computer: IBM - PC
Aluminum Dross 3334

SNAPVENT CO.
147 W Baxter Ave
Knoxville TN 37917-6402
Phone: 615-523-6784
FAX: 615-523-9272
Established 1941
C.E. Easterday, Mgr./Owner
Michael Easterday, Office Mgr.
Aircraft Window Ventilators 3089
Plastic Parts 3089
Market: Int'l; Workers: 5
Plant Size: 5,000 Sq. Ft.
Acrylic Sheet 3081
Acetate Sheet 3081
Polycarbonate Sheet 3081

SOLENE INDUSTRIAL LUBRICANTS
3315 Riverside Dr
Knoxville TN 37914-6430
Phone: 615-521-6444
FAX: 615-522-7615
Established 1988
Mike Wall, Facility Mgr. *
Industrial Lubricants 2992
Market: Multistate; Workers: 5
Plant Size: 10,000 Sq. Ft.
Computer: Gateway - 2000
Base Oil 2911
Cutting & Lubricating Additives 2911
℞ELS LUBRICANTS NORTH AMERICA
5 N Stiles St
Linden NJ 07036
Phone: 908-862-9300

SOUTH KNOXVILLE MONUMENT CO.
3041 Sutherland Ave
Knoxville TN 37919-4560
Phone: 615-522-0625
Established 1936
Mary Epps, Owner
Monuments 3281
Market: Local; Workers: 1
Marble 1411
Granite 1411

SOUTH'S FINEST CHOCOLATE FACTORY
8078 Kingston Pike Ste 101
Knoxville TN 37919-5501
Phone: 615-690-5454
FAX: 615-531-8976
Established 1983
William Douglass, President
Chocolate 2064
Market: Multistate; Workers: 10
Plant Size: 800 Sq. Ft.
Sugar 2062
Cocoa 2066
Milk 0241

SOUTHEASTERN MACHINE REBUILDERS INC.
8424 Asheville Hwy
Knoxville TN 37924-4103
Phone: 615-933-0087
FAX: 615-933-9401
Established 1982
J.T. Chapman, Owner
Rebuild Production Machines 3599
Market: Multistate; Workers: 19*
Plant Size: 47,000 Sq. Ft.
Computer: IBM Compatible
Cold Rolled Steel 3316
Aluminum 3334
Brass 3351

SOUTHERN ALLEGHENY WOOD PRODUCTS
7322 Hodges Ferry Rd
Knoxville TN 37920-9732
Phone: 615-579-9547
FAX: 615-577-4207
Established 1993
John McCann, Operations Mgr.
Door Thresholds 2431
Market: National; Workers: 15
Computer: Samsung
Lumber 2421
Aluminum Extrusion 3354
Paint 2851
Screws 3452

SOUTHERN ARMATURE WORKS INC.
1721 Potter St
Knoxville TN 37917-4835
Phone: 615-522-8639
FAX: 615-522-5808
Established 1979
Troy Perrin, President
James Perrin, Vice President
Rebuilt Electric Motors 3621
Market: Multistate; Workers: 12
Plant Size: 3,150 Sq. Ft.
Annual Sales: $750,000
Computer: IBM
Wire 3315
Bearings 3562

SOUTHERN CAST STONE INC.
✆PO Box 1669
Knoxville TN 37901-1669
☒2100 Sutherland Ave
Knoxville TN 37919-2348
Phone: 615-524-3351
FAX: 615-523-6113
Established 1934
Nelson Russell, Vice President
Concrete Block 3271
Structural Concrete Products 3272
Market: Multistate; Workers: 60
Plant Size: 35,000 Sq. Ft.
Computer: IBM
Sand 1442
Gravel 1422
Cement 3241

SOUTHERN CLUTCH & SUPPLY INC.
✆PO Box 6224
Knoxville TN 37914-0224
☒6713 Rutledge Pike
Knoxville TN 37924-2730
Phone: 800-525-6011
Established 1949
Y.C. Hudson, Owner
Clutch Assemblies 3711
Market: Multistate; Workers: 5
Plant Size: 5,000 Sq. Ft.
Computer: Tandy
Clutch Facings 3292
Release & Tilot Bearings 3714

SOUTHERN FOUNDRY SUPPLY INC.
✆PO Box 1827
Knoxville TN 37901-1827
☒2826 N Central
Knoxville TN 37917-5115
Phone: 615-524-2791
FAX: 615-523-6526
Established 1973
Jeff Stratton, General Mgr.
Ferrous Metals 5093
Nonferrous Metals 5093
Market: Int'l; Workers: 40
Plant Size: 100,000 Sq. Ft.
Computer: Unisys
Scrap Metals 5093
℞SMC CORP.
PO Box 6216
Chattanooga TN 37401
Phone: 615-756-6070

SOUTHERN STATES ASPHALT CO. INC. DIV., ASHLAND OIL INC.
1808 Jones St
Knoxville TN 37920-1816
Phone: 615-577-5151
FAX: 615-579-4176
Established 1988
John Hall, CEO
Gordon Cassity, Mgr. Sales & Ops.
Jeff Day, Plant Mgr.
Asphalt 2911
Heavy Fuel Oil 2911
Market: Multistate; Workers: 10
Plant Size: 10,000 Sq. Ft.
Computer: IBM
Liquid Asphalt 2911
Sand 1442
℞ASHLAND OIL INC.
PO Box 391
Ashland KY 41114
Phone: 606-329-3333

SPECIALTY PRINTING CO.
3705 Sutherland Ave
Knoxville TN 37919-4338
Phone: 615-584-3891
Established 1953
Earl Day, President
Printing 2752
Market: Multistate; Workers: 3
Plant Size: 2,000 Sq. Ft.
Annual Sales: $200,000
Paper 2621
Ink 2893

SPINLAB UTILITY INSTRUMENTATION
10330 Technology Dr
Knoxville TN 37932-2570*
Phone: 615-671-2484
FAX: 615-671-2488
Established 1990
N.J. Ackermann Jr., Vice President*
Utility Testing Equipment 3825
Market: Int'l; Workers: 6*
Plant Size: 2,200 Sq. Ft.
Current Probes 3845

SPORTS BELLE INC.
✆PO Box 50243
Knoxville TN 37950-0243
☒6723 Pleasant Ridge Rd
Knoxville TN 37921-1021
Phone: 615-938-2063
FAX: 615-947-4466
Established 1974
Jesse Lee, President
John Sewell, Operations Dir.
Gene Shular, Plant Mgr.
Athletic Apparel, Men's 2329
Athletic Apparel, Women's 2339
Market: National; Workers: 140
Plant Size: 20,000 Sq. Ft.
Computer: Digital
Nylon Fabric 2221
Polyester Fabric 2221
Lycra 2221

STALEY GRANITE & MARBLE INC.
✆PO Box 9126
Knoxville TN 37940-0126
☒2805 Cinder Ln
Knoxville TN 37914-9526
Phone: 615-521-6890
FAX: 615-524-0951
Established 1972
Brian Staley, President*
Marble Fireplaces 3281
Marble Window Sills 3281
Marble Tabletops & Tile 3281
Marble & Granite Products 3281
Market: Int'l; Workers: 12
Plant Size: 30,000 Sq. Ft.
Computer: IBM
Marble 3281
Granite 3281

STEEL PLATE FABRICATORS
✆PO Box 11112
Knoxville TN 37939-1112
☒3703 Papermill Rd
Knoxville TN 37909-1521
Phone: 615-522-1700
FAX: 615-673-8360
Established 1945
John E. Turner, President
Jill Hudson, Controller
Mike Russell, Data Pro. Mgr.
Jill R. Davis, Personnel Mgr.
Steel Plate Fabrication 3443
Sheet Metal Job Shop 3444
Market: Multistate; Workers: 48
Plant Size: 65,000 Sq. Ft.
Computer: Compaq
Steel Sheets 3316
Steel Plates 3316
Steel Shapes 3316

STERLING WINDOW SYSTEMS
6705 Pleasant Ridge Rd
Knoxville TN 37921-1021
Phone: 615-938-0422
FAX: 615-947-2750
Established 1976
Sterling Lance, President
Mike Lance, Vice President
Therm. Replacement Windows 3442
Vinyl Replacement Windows 3089
Insulating Glass 3211
Market: Multistate; Workers: 24'
Plant Size: 24,000 Sq. Ft.
Annual Sales: $2,000,000
Computer: IBM - PC
Glass 3211
Aluminum Extrusions 3355
Vinyl Extrusions 3089

STONECRAFT INC.
✆PO Box 22069
Knoxville TN 37933-0069
☒10524 Lexington Dr
Knoxville TN 37932-3211
Phone: 615-966-3900
FAX: 615-966-3930
Ricciardi Jones, CEO
Ellen Jane Jones, Secretary/Treasurer
Sam Letsinger, Controller
Dorothy Swaggerty, Export Mgr.
Vera Whaley, Mkt.-Sales Mgr.
Dorothy Swaggerty, Office Mgr.
Dorothy Swaggerty, Personnel Mgr.
Glenn Owens, Plant Mgr.
Glenn Owens, Purchasing Mgr.
Joe Terry, Traffic Mgr.
Marble, Granite Countertops 3281
Stone Floors 1741
Stone Fireplaces 1743
Stone Walls 1741
Market: Multistate; Workers: 14
Plant Size: 5,000 Sq. Ft.
Annual Sales: $900,000
Computer: IBM
Marble 1411
Granite 1411
Slate 1411
Limestone 1411

STUBLEY-KNOX LITHO CO.
1528 Island Home Ave
Knoxville TN 37920-1813
Phone: 615-523-4567
FAX: 615-573-2220

◆—New listing; ☒—Location; ✆—Mailing address; ℞—Parent company; *—New information in this edition. Products are in bold type; raw materials in italics.

Ductile Iron Castings 3321
Steel Castings 3325
Fabricated Metal Products 3499
Metal Work 3449

IKG BORDEN
Nashville (Davidson Co.) TN
Market: Int'l; Workers: 140
Phone: 615-242-4262
Aluminum Grating 3446
Fiberglass Gratings 3089
Steel Grating 3325
Deck Spans 3448

PRECISION CASTINGS OF TENNESSEE INC.
Gallatin (Sumner Co.) TN
Market: Int'l; Workers: 60
Phone: 615-451-9080
Precision Steel Castings 3325
Steel Investment Castings 3324

QUAD INDUSTRIES INC.
Bradford (Gibson Co.) TN
Market: Multistate; Workers: 20
Phone: 901-742-3903
Cast Bearings 3325
Copper Bearings 3366
Plain Bearings 3562
Screw Machine Products 3451

ROYAL BRASS & HOSE
Knoxville (Knox Co.) TN
Market: National; Workers: 45
Phone: 615-558-0224
Hydraulic Hoses 3492
Brass Fittings 3432
Steel Adapters 3325
Fasteners (Nuts, Bolts) 3452

SPECIALTY ALLOYS CORP.
Gallaway (Fayette Co.) TN
Market: National; Workers: 30
Phone: 901-867-2126
Alloy Briquettes 3325
Silicon-Manganese Briquettes 3339

TENNESSEE INVESTMENT CASTINGS CO. INC.
Bristol (Sullivan Co.) TN
Market: National; Workers: 80
Phone: 615-968-4252
Precision Steel Castings 3325

3334 Primary Production of Aluminum

ALUMINUM CO. OF AMERICA
Alcoa (Blount Co.) TN
Market: Int'l; Workers: 2100
Phone: 615-977-2011
Aluminum 3334
Recycle (Smelt) Aluminum 3341

HUTCHERSON METALS INC.
Halls (Lauderdale Co.) TN
Market: National; Workers: 82
Phone: 901-836-9435
Aluminum Sows 3334
Recycle Scrap Iron 5093

SMOKEY MOUNTAIN SMELTERS INC.
Knoxville (Knox Co.) TN
Market: National; Workers: 19
Phone: 615-573-4473
Aluminum Ingots 3334

TENNESSEE ALUMINUM PROCESSORS
Mount Pleasant (Maury Co.) TN
Market: State; Workers: 110
Phone: 615-379-5836
Aluminum Processing 3334

3339 Primary Smelting & Refining of Nonferrous Metals, Except Copper & Aluminum

ALLIED METAL RECOVERY CO.
Oliver Springs (Roane Co.) TN
Market: State; Workers: 2
Phone: 615-435-0894
Silver Refinery 3339

D.M.S. REFINING INC.
Dandridge (Jefferson Co.) TN
Market: National; Workers: 13
Phone: 615-397-9447
Refine Precious Metals 3339

GENERAL SMELTING & REFINING INC.
College Grove (Williamson Co.) TN
Market: Multistate; Workers: 40
Phone: 615-368-7125
Refine Metal 3339
Lead Products 3341

MANUFACTURING SCIENCES CORP.
Oak Ridge (Anderson Co.) TN
Market: Int'l; Workers: 28
Phone: 615-481-0455
Beryllium 3339
Rolling of Depleted Uranium 3356

REFINED METALS CORP.
Memphis (Shelby Co.) TN
Market: Multistate; Workers: 150
Phone: 901-775-3770
Lead Refining 3339
Antimonial Lead Alloys 3341

SAVAGE ZINC INC.
Gordonsville (Smith Co.) TN
Market: Local; Workers: 250
Phone: 615-683-6411
Zinc Ore Mining 1031
Zinc Concentrate 3339

SPECIALTY ALLOYS CORP.
Gallaway (Fayette Co.) TN
Market: National; Workers: 30
Phone: 901-867-2126
Alloy Briquettes 3325
Silicon-Manganese Briquettes 3339

3341 Secondary Smelting & Refining of Nonferrous Metals

ALLOY EXCHANGE
Newbern (Dyer Co.) TN
Market: Int'l; Workers: 5
Phone: 901-627-3251
Metal Processing 3341

ALUMINUM CO. OF AMERICA
Alcoa (Blount Co.) TN
Market: Int'l; Workers: 2100
Phone: 615-977-2011
Aluminum 3334
Recycle (Smelt) Aluminum 3341

CHATTANOOGA RECYCLED FIBER
Chattanooga (Hamilton Co.) TN
Market: Local; Workers: 10
Phone: 615-267-0097
Paperboard 2631
Aluminum 3341

F. PERLMAN & CO. INC.
Memphis (Shelby Co.) TN
Market: Int'l; Workers: 39
Phone: 901-526-7651
Scrap Steel Processing 5093
Nonferrous Metal 3341

GENERAL SMELTING & REFINING INC.
College Grove (Williamson Co.) TN
Market: Multistate; Workers: 40
Phone: 615-368-7125
Refine Metal 3339
Lead Products 3341

IMCO RECYCLING INC.
Rockwood (Roane Co.) TN
Market: Int'l; Workers: 130
Phone: 615-354-3626
Recycle Aluminum Cans 5093
Scrap Aluminum Ingots 3341

KNOX METALS CORP.
Knoxville (Knox Co.) TN
Market: National; Workers: 45
Phone: 615-637-4353
Scrap Iron 5093
Nonferrous Metals 3341

METAL RESOURCES INC.
Loudon (Loudon Co.) TN
Market: National; Workers: 64
Phone: 615-458-2007
Secondary Smelting of Aluminum 3341

PGP SILVER PROCESSING
Coalfield (Morgan Co.) TN
Market: National; Workers: 18
Phone: 615-435-1704
Recovery of Silver from Film 3341

REFINED METALS CORP.
Memphis (Shelby Co.) TN
Market: Multistate; Workers: 150
Phone: 901-775-3770
Lead Refining 3339
Antimonial Lead Alloys 3341

SIGNAL ALLOYS CO.
Chattanooga (Hamilton Co.) TN
Market: National; Workers: 14
Phone: 615-624-5051
Zinc Alloys 3341

SMELTER SERVICE CORP.
Mount Pleasant (Maury Co.) TN
Market: National; Workers: 40
Phone: 615-379-7765
Aluminum Smelting 3341

SOUTHERN FOUNDRY SUPPLY INC.
Chattanooga (Hamilton Co.) TN
Market: National; Workers: 155
Phone: 615-756-6070
Recycled Metal 3341

STEINER-LIFF IRON & METAL CO.
Nashville (Davidson Co.) TN
Market: Int'l; Workers: 150
Phone: 615-271-3300
Scrap Metal 5093
Scrap Iron & Metal Processing 3341

STURDY LITE INC.
Bristol (Sullivan Co.) TN
Market: National; Workers: 10
Phone: 615-968-7021
Aluminum Extrusions 3341

TECHNICAL PLATING & RUBBER INC.
Watertown (Wilson Co.) TN
Market: National; Workers: 15
Phone: 615-237-9767
Plastisol Coating 3479
Electroplating & Plating 3471
Polyurethane Castings/Coating 3089
Silver/Tin/Electroless Nickel 3356
Zinc Plating 3341

TWIN CITY IRON & METAL CO. INC.
Bristol (Sullivan Co.) TN
Market: Multistate; Workers: 23
Phone: 703-466-2022
Metal Processing 3341

UNITED STATES BRONZE POWDERS INC. - ROYAL DIV.
Maryville (Blount Co.) TN
Market: Int'l; Workers: 18
Phone: 615-982-8096
Copper Smelting 3341

WABASH ALLOYS INC.
Dickson (Dickson Co.) TN
Market: Multistate; Workers: 70
Phone: 615-446-0600
Aluminum Foundry 3365
Aluminum Smelting 3341

3351 Rolling, Drawing, & Extruding of Copper

APACHE GROUNDING
Lebanon (Wilson Co.) TN
Market: National; Workers: 28
Phone: 615-449-1962
Galvanized Grounding Rods 3312
Copper Grounding Rods 3351

HUDSON INTERNATIONAL CONDUCTORS
Trenton (Dade Co.) GA
Market: National; Workers: 60
Phone: 706-657-7541
Magnet Wire 3351
Thin Wall Tubing 3599

TATE FABRICATING CO. INC.
White House (Robertson Co.) TN
Market: State; Workers: 100
Phone: 615-672-4909
Fabricated Structural Steel 3441
Brass 3351

W. BOMAS MANUFACTURING CO. INC.
Nolensville (Williamson Co.) TN
Market: National; Workers: 4
Phone: 615-776-2840
Copper & Brass Gift Items 3999
Aluminum Gift Items 3999
Brass Railings 3351
Architectural Brassware 3351

WESTINGHOUSE ELECTRIC CORP., ELECTRICAL MATERIALS DIV.
Abingdon (Washington Co.) VA
Market: National; Workers: 400
Phone: 703-676-9100
Copper Wire 3351

WOLVERINE TUBE INC.
Ardmore (Giles Co.) TN
Market: National; Workers: 75
Phone: 615-427-2034
Copper Tubing 3351

3353 Aluminum Sheet, Plate, & Foil

CRESSONA ALUMINUM CO.
Elizabethton (Carter Co.) TN
Market: Int'l; Workers: 245
Phone: 615-543-3561
Extruded Aluminum Pipe & Tube 3354
Aluminum Extrusions 3354
Extruded Mini-Plate 3353

DAVIDSON MANUFACTURING CORP.
Smyrna (Rutherford Co.) TN
Market: National; Workers: 100
Phone: 615-459-6094
Wood Ladders 2499
Aluminum 3353
Fiberglass 2221

NORANDAL USA INC.
Huntingdon (Carroll Co.) TN
Market: Int'l; Workers: 235
Phone: 901-986-5011
Aluminum Foil 3353
Aluminum Sheet 3353

END